APRY 5,190

APR TO 1561

THE SHEFFIELD TWIST DRILL AND STEEL COMPANY LIMITED SHEFFIELD ENGLAND

DORMER DRILLS ARE OBTAINABLE FROM YOUR USUAL ENGINEERS' MERCHANTS



3PS - The Radial of Advanced Design

Compact grouping of controls, special form of spindle mounting ensuring rigidity and accuracy of spindle alignment. Pillar and sleeve construction with precision locking arrangement — These and many other features are embodied in the 3PS type radial which is designed for maximum

radial which is designed for maximum production and highest efficiency. Drilling Capacity up to 3in. dia. from the solid in steel, continuously. Maximum radius up to 12ft.

WILLIAM ASQUITH LTD. HALIFAX · ENGLAND

Member of the Asquith Machine Tool Corporation

Sales and Service for the British Isles

DRUMMOND-ASQUITH LIMITED

Member of the Asquith Machine Tool Corporation



O

Le

• thr Mech

Feed Dress

Addit finish locke

3

provide FLEXIBILITY



Mechanism which gives easy set-up by a simple dialling system for

 Wheel Retraction
 Start of Coarse and Fine Feeds Coarse and Fine Feed Rates Wheel Dressing Point Wheel Wear Compensation

Additionally, table traverse rates for dress, rough and finish grind are infinitely variable. ALL settings can be locked in position to ensure constant production.

GAGE-MATIC AND SIZE-MATIC, PLAIN AND TOOLROOM MODELS

BELT DRIVEN WHEELHEAD UP TO 100,000 R.P.M.

ATTACHMENTS FOR FACE GRINDING, COMBINATION BORE AND FACE GRINDING, FORM GRINDING ETC.



You'll find IT PAYS to come to-

OEALD

HEALD MACHINES LIMITED . BIRMINGHAM 24 . ENGLAND

Sales Representatives · ALFRED HERBERT LIMITED · COVENTRY

G.26. Heavy duty, high speed grinder with independent drive to each wheel. Can be supplied with dust extraction equipment to C.I.R.A. design, with 20" 2" or 24" 2" wheels.

UNION
grinding
machines
WITH WHEEL SIZES
10"×1" up to
24"×3"

Union "Jubilee" light duty grinder or polisher. Supplied with , pelishing spindle in place of one or both wheels if desired.

Double-ended medium duty grinder. Can be supplied with coolant, eye shields twist drill grinding attachment or arranged for side grinding.

Literature available covers the Harrison range of Lathes from 9in. to 17in. swing; Milling, Drilling and Grinding Machines and Engineers' Accessories.

T. S. HARRISON & SONS LTD

HECKMONDWIKE

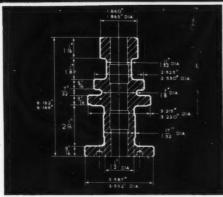
YORKSHIRE

When answering advertisements kindly mention MACHINERY.









MACHINED IN 45 SECONDS

This 12-spindle No. 10 Ryder Verticalauto produces two machined transmission countershaft gears at each index.

Stellite and H.S.S. Tools cutting at moderate speeds and feeds have eliminated swarf problems and hydraulic operation of the mandrels and automatic hydraulic operation of the Loose Headstocks make loading easy to achieve within the cycle time.



VERTICALAUTO

Thos. Ryder & Son, Limited, Turner Bridge Works, Bolton, England.

Makers also of single spindle Rydermatics and Piston Ring Lathes.

for speed and long life

ECLIPSE



there's



nothing



to beat them





HACK SAW BLADES

'Eclipse' hacksaw blades and other tools are made by James Neill & Co. (Sheffield) Ltd. and are obtainable from all tool distributors.



The Majesty of Mars

This is a view of Mars from its nearer moon Phobos 3,700 miles away. It is early Spring on the planet, the polar caps are retreating whilst the dark areas almost certainly vegetation .. are expanding. The dusky red glow comes from the desert areas.

The little moon we are standing on is only ten miles in diameter a chunk of rock roughly twice the size of Mt. Everest. Its gravity is so weak that a man in any sort of condition whatsoever could easily leap off into space.

Mars is inevitably one of the goals of our advancing technology and in that technology "Capital" High Speed Steel Twist Drills, Cutters, Reamers, and other Engineers Tools have pride of place. Balfours have always produced Tools and Steel for the World: soon it will be for the Worlds.

STEEL & TOOLS

ARTHUR BALFOUR

FOR THE WORLD

ARTHUR BALFOUR & CO LTD. CAPITAL STEEL WORKS, SHEFFIELD ENGLAND.
ASSOCIATED COMPANY: THE EAGLE & GLOBE STEEL CO, LTD.

PEOPLE

for

MACHINE TOOL
REBUILDING

are...

newman

OVER A
QUARTER OF
A CENTURY'S
EXPERIENCE

NEWMAN INDUSTRIES LIMITED

YATE . BRISTOL . ENGLAND

Telephone: Chipping Sodbury 331

ABWOOD

HIGH PRECISION

TOOL & DIE SURFACE GRINDER

TABLE WORKING SURFACES



104" UNDER WHEEL

HYDRAULICALLY OPERATED

RAPID POWER ELEVATION OF KNEE

HIGH PRODUCTION WITH VERSATILITY

SENSITIVE CONTROLS WITH RUN OUT TO LOADING POSITION



Pressure lubricated completely covered slideway:

Hydraulic reservoir and pump housed in base.

Large capacity mobile coolant to with removable sludge tray.

Segmental chuck available for maximum stock removal.

Built to Schlesinger limits.

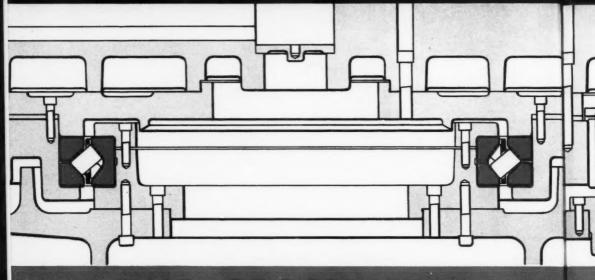
Finishes to 1.5 micro inches on suitable materials.

Manual table traverse for use wi Cutter Grinding Attachment.

ABWOOD MACHINE TOOLS LTD., PRINCES ROAD, DARTFORD, KENT

Telephone: Dartford 25271 (5 lines)

Telegrams: ABWOOD DARTFORD



THE CROSSED-ROLLER

ON THE BICHARDS 5' 0" VERTICAL BORING AND TURNING MILL

In this substantially built Double-Standard vertical boring and turning mill, rigidity and freedom from backlash have received special study, and the above drawing shows how the precision crossed-roller bearing is used for the mounting of the rotary table. In this Timken bearing, alternate rollers face in opposite directions, so that a single crossed-roller bearing can resist a tilting couple normally withstood by two Timken bearings spaced apart.

This bearing, which has perfect rolling geometry despite its unusual appearance, has a greater capacity than that of any other bearing of similar section, though less than that of two separate Timken bearings—which of course contain twice as many rollers.

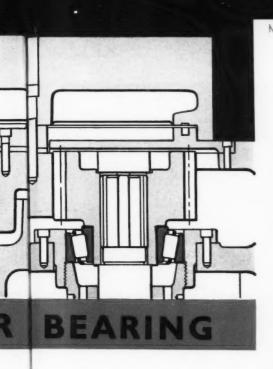
Since the bearing is self-contained, it lends itself to an extremely short and stiff mounting; furthermore it is chiefly used where a large bore bearing is natural to the design of the machine; it combines rigidity, compactness and freedom, while its large bore is of great value in providing passage-way for electrical, hydraulic and mechanical equipment.

British Timken, Duston, Northampton, Division of The Timken Roller Bearing Company. Timken bearings manufactured in England, Australia, Brazil, Canada, France and U.S.A.

TIMKEN

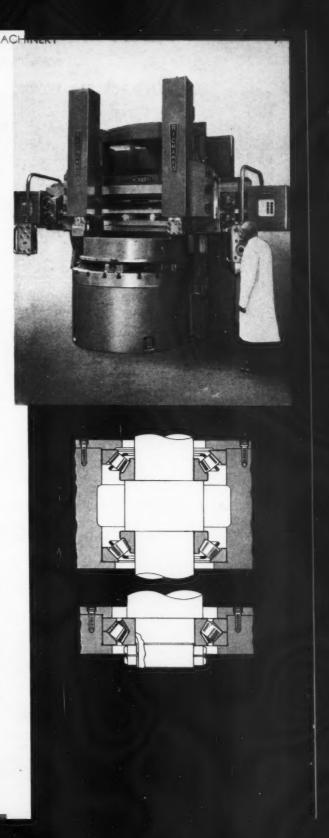
REGISTERED TRADE-MARK

tapered roller bearings

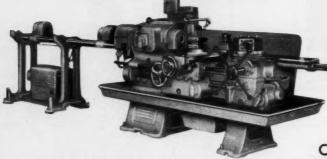


The basis of the crossed-roller bearing

The upper diagram at right shows two steep-angle Timken tapered roller bearings. If the cups and cones of these bearings were skimmed down and brought together as shown in the lower diagram, it would be possible to take half the rollers from one bearing, and half from the other, and alternate them with their tapers pointing in opposite directions. That is the essence of the crossed-roller bearing.

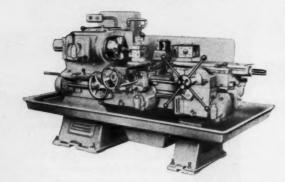


RAM TYPE FOR BAR WORK



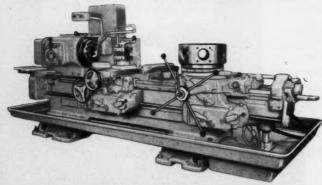
AVAILABLE IN 5 SIZES FOR BARS & TO 44" DIA.

RAM TYPE FOR CHUCK WORK



AVAILABLE IN 5 SIZES WITH 10" OR 12" CHUCKS

SADDLE TYPE FOR BAR AND CHUCK WORK



FIXED CENTRE OR CROSS SLIDING TURRETS

Jones & Lamson Machines are now made in Belgium by the newlyformed company Le Progres Industriel & Jones & Lamson S.A. for whom we are the Sole Agents in United Kingdom.

JONES LAMSON

MACHINE TOOL
CRAFTSMEN SINCE 1835

OFFERS THE BEST INVESTMENT IN

TURRET LATHES

BUILT AND POWERED TO PRODUCE

CHIPS PER TOOLS

MORE PIECES
PER HOUR

MORE PROFITS
PER IOB

FOR FULL PARTICULARS WRITE TO-

Buck & Hickman

MACHINE TOOL DIVISION
OTTERSPOOL WAY · WATFORD BY-PASS
WATFORD · HERTS

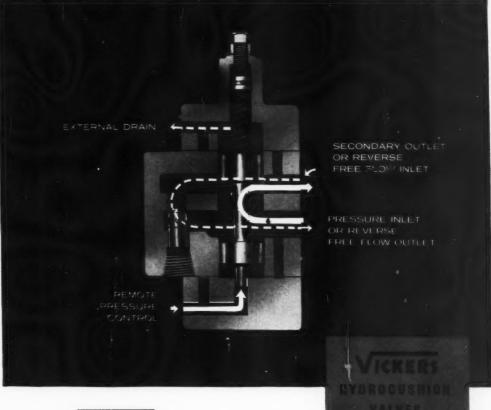
P.O. BOX 74, WHITECHAPEL ROAD, LONDON E.I

ALPERTON - BIRMINGHAM - BRISTOL GLASGOW - LEEDS - MANCHESTER

D

E.1





Why VICKERS leads the field

in Hydraulics

No one name can dominate an entire branch of engineering as VICKERS does in hydraulics, except by a long history of proven service to the whole industry.

Only RELIABILITY could have brought VICKERS so far to the front—reliability in design, reliability in performance and reliability in service.

When mechanical and civil engineers specify VICKERS they are specifying the best; to obtain continuous, reliable performance at minimum operating cost.

Write for full details:

STEIN ATKINSON VICKERS HYDRAULICS LTD

197 Knightsbridge, London, S.W.7 Telephone: KNIghtsbridge 9641

Technical Sales and Service in London, Glasgow, Birmingham, Leeds and Manchester

SAS31





The modern Stirk Planer, with built-in electrical equipment, possesses many distinctive features which make it one of the world's finest planing machines. The easy control and fine accuracy of the modern planing machine is due in no small measure to the continuous development of Stirk Planers. For more than fifty years Stirk Planers have influenced the design and set the standard by which others are judged.

JOHN STIRK & SONS LIMITED

OVERSEAS AGENTS.-

HALIFAX - ENGLAND

OVERSEAS AGENTS.—

AUSTRALIA: Gilbert Lodge & Co. Ltd., 386, Harris Street, Ultima, Sydney, N.S.W. CANADA: Williams & Wilson Ltd., 544, Inspector Street, Montreal. FRANCE: Societe Anonyme Alfred Herbert, 1 and 3, Rue du Delta, Paris (9°). HOLLAND: Esmeijer & Co., Oosterkade 24, Rotterdam C. INDIA: Alfred Herbert (India) Ltd., 13/3, Strand Road, P.O.B. 681, Calcutta 1. NEW ZEALAND: Gilbert Lodge & Co. Ltd., Head office: 55, Station Road, P.O. Box 12-063, Penrose, Auckland, S.E.6. N.Z., also at Christchurch and Wellington. PAKISTAN: Guest, Keen & Nettlefolds in Pakistan Ltd., P.O.B. 819, Bank of India Buldings (3rd Floor), Bunder Road, Karachi. SPAIN: Gumuzio S.A. Gran Via 48, Apartado 920, Bilbao. KENYA, UGANDA, TANGANYIKA & ZANZIBAR: Len Cooper Ltd., P.O.B. 3796, Nairobi, Kenya. SWEDEN: Aktiebolegat Servus, Malmskillnadsgatan 46, Stockholm.



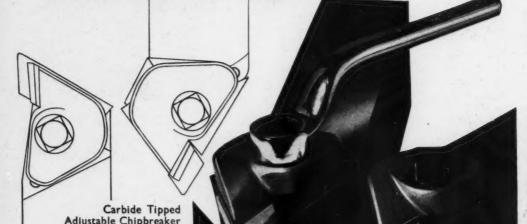




Among the most prized possessions of resourceful engineers—QUALCUT TOOLS

QUALCUT TOOLS LIMITED, HANDSWORTH RD., SHEFFIELD 13. TEL: SHEFFIELD 49371/6

The only completely successful COPY LATHE TOOL





Among the most prized possessions of resourceful engineers—QUALCUT TOOLS

QUALCUT TOOLS LIMITED, HANDSWORTH RD., SHEFFIELD 13. TEL: SHEFFIELD 49371/6

1961 April 5, 1961

MACHINERY

1



The only completely successful COPY LATHE TOOL



Built on the Veraloy principle of clamping of hard metal they will save you more than half your tooling cost and increase output



For details and demonstration write to:

VERALOY PRODUCTS LIMITED

BEECH ROAD · THE MARSH · HIGH WYCOMBE · BUCKINGHAMSHIRE

Telephone: High Wycombe 2795-8 Telegrams: Veraloy High Wycombe

When answering advertisements kindly mention MACHINERY.



Lapointe design skill does not stop at the basic broaching machine. It goes right through to the design of fittings and fixtures . . to hold all components no matter their shape. The Lapointe 66" DRV. for example, is now busily broaching Stub Axles. Even these intricately shaped components, with difficult-to-get-at faces, set no problem at all to Lapointe engineers. They adapted the machine, designed the fixture and broach hoist to simplify removal of broach bodies when blades have to be changed. They showed that their ingenuity can surmount all obstacles . . . that it pays to come to Lapointe for better broaching.

photographs by courtesy of Armstrong Patents Co. Ltd.

POINTE for better broaching

British Made

HIRE



The Lapointe Machine Tool Co Ltd

Otterspool Watford By-Pass Watford Herts Watford 31711 (4 lines) Cables: Lapointe Watford Subsidiary: Lennie & Thorn Limited Bracknell Berkshire also The Lapointe Machine Tool Company Hudson Mass. USA

When answering advertisements kindly mention MACHINERY.



ROUNDNESS LESS THAN A ACTUAL: 100,000



THANKS TO TIMKEN "DO

the advantages of "fine boring"

techniques are now universally accepted by progressive firms.

By running the cutting tool at its maximum cutting speed, time is saved, and accuracy and finish greatly improved. Hitherto such machines were limited to light cuts and fixed centre heights: this is no longer so. The Milnes Heavy duty boring machine has overcome these limitations, and has extended the application to a wide range of general engineering components either as one offs or batches of thousands. The machine is capable of roughing castings with cuts up to in. deep, and spacing accurately any number of bores. It is robust, dependable and easy to operate, and can be profitably employed in all modern machine shops.

MATERIAL: ALUMINIUM C.L.A. 10u' CENTRE LINE AVERAGE TEN MICRO INCHES (MILLIONTHS)



produced by

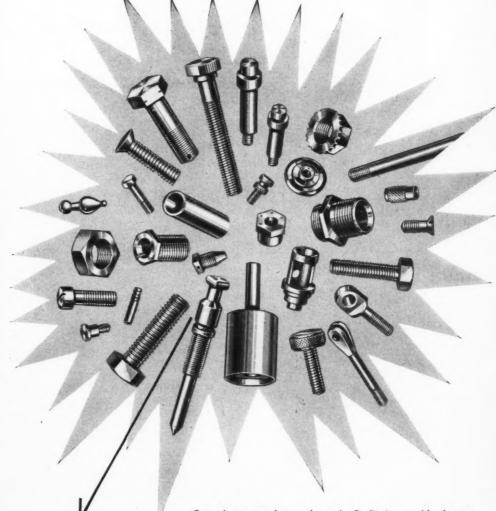
devised and

WKS., ROSSE ST., BRADFORD 8, YORKS TELEPHONE : BFADFORD 41301

EST. 1858



firms.
, time
o such
eights:
achine
cation
as one
ughing
ly any
perate,



Repetition work

Ormond can cope whatever the need. Quality is assured by the name, and manufacturing resources are second to none. An unrivelled reputation for service takes care of prompt delivery. Please ask us to quote. Any quantity.

The Repetition Parts range covers single and multi spindle automatics up to 1½" dia., Brass, Steel and Light Alloy Screws in Rolled and Cut Threads, Grubscrews, Nuts, Allthreads, Hexagon Bolts and Setscrewsturned from bar and Cold Headed Grades "A", "B", and High Tensile.



THE ORMOND ENGINEERING CO. LTD. ORMOND HOUSE · ROSEBERY AVENUE · LONDON, E.C.1

Telephone: TERminus 2888

Telegrams: "Ormondengi, Cent."

the world's finest threading equipment

MADE IN OUR OWN WORKS

A complete range of equipment for cutting or rolling standard threads and special threads such as Acme, Knuckle, Buttress; single or multi-start; right- or lefthand; short and taper threads—in all materials that can be threaded.

coventry diemeter. 1500 sizes and types of Coventry Dies. The new XT Type Diehead has been specially designed for use on single-spindle automatics. Self-opening mechanism is not affected by rapid indexing of the turret. Coventry Junior Taper-threading Diehead. Five sizes ½" to 1½". Larger sizes made to order.

HERBERT SOLID-ADJUSTABLE DIEHEADS. Eight sizes, $\frac{1}{4}$ " to $2\frac{1}{4}$ " diameter. For machines having reverse to the spindle.

HERBERT GROUND THREAD ROLLING DIES. For Thread Rolling Heads and Machines.

HERBERT GROUND THREAD TAPS. Best quality high-speed steel. Stocked for all standard threads, special taps to order.

THREAD CHASING TOOLS. For Cri-Dan and other threading machines, capstan and turret lathes. Ardoloy-tipped or High-speed steel. Tangential, square or circular types; full or truncated forms.

We also supply complete equipment for tool maintenance and for the measurement and inspection of screw threads.

Consult our specialists on all threading problems





Messrs. Aston Martin Lagonda Ltd., manufacturers of the power unit for the Aston Martin D.B.4 Saloon, rely on the Herbert/DeVlieg Jigmil for milling, boring and counter-boring operations on the cylinder head and block.

Using the principle of jigless boring, whereby work can be machined from two, three or four sides at one setting for milling, boring, drilling, tapping, facing or counter-boring operations in precise relationship, the Jigmil is the ideal machine for this type of work.

Two sizes of Jigmil are now manufactured in this country:— the 2B-36 (capacity 24" vertical × 36" horizontal travel and 21" dia. spindle) and the 3H-48 (capacity 36' vertical x 48" horizontal travel and 3" dia. spindle).

HERBERT ITO, COVENTRY



AD598

intenance

v threads.

961

machine
you can't
afford to be
without!

A & S Model 2D
Production Milling Machine
with automatic cycle

Model 2B also available with normal automatic feed

Somebody said "You cannot do to-day's job
on yesterday's tools and still be in business
to-morrow." If you agree, how can you afford not to
replace slow, out-of-date machinery by modern highefficiency equivalents? What this country needs is simple
automatic-cycle tools like our model 2D, that save money by
doing more work per man-hour. Here you have a heavy, powerful
miller giving you fast controlled production from a simple
mechanical automatic cycle at an economic price. With its
23" automatic table traverse 20 table feeds and 12 spindle speeds
it is capable of higher output per pound capital cost than either
(a) a general purpose machine with its high labour wastage or
(b) a too complicated and costly fully automatic machine,

Let us send you a brochure describing this machine fully.



ADCOCK & SHIPLEY LIMITE

P.O. Box 22, ASH STREET, LEICESTER Tel. Leicester 24154-6 Telegrams & Cables: Adcock, Leicester

Built up to a standard-not down to a price

Schneider SURFACE GRINDING MACHINE

> IMMEDIATE DELIVERY FROM STOCK

> > MODEL JOH2



Table 60" x 16"

Capacity 66" x 24" x 22"

Please send for full details.

EXCLUSIVE DISTRIBUTORS IN THE UNITED KINGDOM

EGAR MACHINE TOOL COMPANY LIMITED

172-178 VICTORIA ROAD · ACTON · LONDON W3 · Telephone ACORN 5555 MIDLANDS SHOWROOM: 1075 KINGSBURY ROAD, ERDINGTON, BIRMINGHAM 24. Tel: Castle Bromwich 3781/2 SOLE SCOTTISH AGENTS: ANGUS & CRICHTON (SALES) LTD., 7 MIDLAND STREET, GLASGOW C.I. TELEPHONE: CITY 4560

When answering advertisements kindly mention MACHINERY.

LIMITE

STER

rice



When it's a Question of Cutting Oils and Coolants...

the obvious answer is to call in Edgar Vaughan—a specialist firm with over sixty years' experience in this field.

NEAT CUTTING OILS BROACHING OILS GRINDING OILS

TAPPING OILS

HONING OILS

SOLUBLE OILS (Emulsion types Translucent types)

DRAWING OILS

HYDRAULIC OILS (Including Houghto-Safe Fire-resistant types)

QUENCHING OILS TEMPERING OILS

LUBRICATING
OILS AND GREASES

The recommendation of suitable cutting oils and coolants is undertaken by an experienced staff who are fully equipped to give production engineers the benefit of an intensive research and technical service, without obligation.





LEGGE STREET - BIRMINGHAM 4

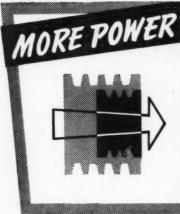


Works and Depots at Birmingham, Manchester, Liverpool, London (Southall), Bristol, Glasgow.



In association with the Houghton group of companies all over the world.

OLYMPIA LONDON APRIL 20 -- MAY 4 1961 STAND No. 15 INNER ROW GALLERY, GRAND HALL

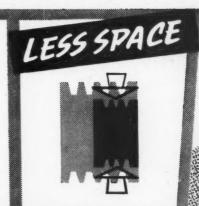


SMALLER PULLEYS

NARROWER RIMS

SHORTER CENTRES





... thanks to

Com-Pac Wedgev

the NEW

WEDGE VEE

COM-PAC PULLEYS

Taper bushed or bored and keywayed. Stock range in preparation. Com-Pac Pulleys made to YOUR specification

COM-PAC BELTS

Heat & oil resistant (anti-static)—Collingwood quality Com-Pac Wedge V Drives are additional to the stock range of "Collingwood" Vee Rope Drives.



THE LOGICAL SUCCESSOR TO THE VEE ROPE

The London Shafting & Pulley Co. Ltd.

(Comp	lete cou	pon an	d mai	l in	open	enve	elo	pe)
Please	forward	details	of "C	com-	-Pac'	to:			
Name.							_	_	
Addres	s							-	

---- Position ----

irmingrerpool, Bristol,



way ahead?

expand, to modernise your machinery. But carrying them out may not be so easy. Can British Wagon help? The British Wagon Finance Plan allows you to acquire new machines or plant without seriously affecting those vital capital reserves. The terms of the B.W. Plan are economical and flexible; the procedure simple. Discuss your requirements with your local British Wagon branch manager—for immediate, friendly and practical advice, backed by over 90 years' sound financial experience. . .



... or write for our leaflet
'Financing the Cost'. It gives
you full details of how the
British Wagon Finance
Plan can help you.

British Wagon

Head Office:

Moorgate, Rotherham, Yorkshire Tel. Rotherham 5466 Southern Head Office: Rotherham House, Grosvenor Crescent, London, S.W.1. Tel. Belgravia 8000



BW/M/83





TH.KIESERLING & ALBRECHT

MACHINE TOOL MANUFACTURERS - SOLINGEN - GERMANY

630 tons capacity SKH 2 MINI HILL British Agent: F. W. KUBACH Led., Wakefield House, 106, Church Rd., London, S.E.19. -0 SKH 6

ACCURATE FORGING ON FORGERS

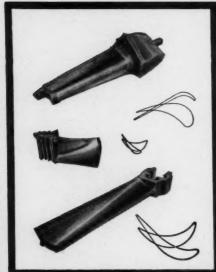
SKH 11/2 200 tons capacit

SKH 21/2

SKH 5



The only precision copy belt grinding machine in the world to reproduce any shape of turbine blade





- Automatic machine cycle—one operator can control a bank of machines
- Accurate to ± ⋅002 in.
- Currently operating throughout the British turbine industry

CYRIL ADAMS & CO. LTD.,

155 East Barnet Road, New Barnet, Hertfordshire Telephone: Barnet 2335/6/7

Designers and Manufacturers of Jigs, Fixtures and Special Purpose Machine Tools

Member of the Staveley Coal & Iron Co. Limited Group of Companies, in association with James Archdale and George Richards



Member of the Machine Tool Trades Association





30t Maximum Production

THE PATENTED HYDRAULIC

PRELECTOR

PRE-SELECTIVE SPEED-CHANGING SYSTEM

Giving rapid changes from any one speed in the range to any other by the movement of a single lever. This device allows for a simultaneous change of speed and direction of rotation.

Photograph

Our complete range includes Capitan and Turnet Lethes

with capacities up to 35in, twing over the bed and 8jm, the hole through spind

H. W. WARD & Co Ltd

TURRET LATHE SPECIALISTS

SELLY OAK BIRMINGHAM 19

Phone: Selly Oak 1131



Please write for descriptive Brochure P7

W.669



Both halves at once



SWISS RIGID

AUTOMATIC
HYDROCOPYING
DIE-SINKING
MACHINE KA 200

Reverse image attachment copy mills both left- and right-hand die halves at the same time from the same model. Copying is accurate to within .002", fully automatic and needs no supervision. 360° profiles can be produced without using a rotating table and feed is constant—and on vertical contours up to 90°. Light feeler pressure permits the use of wooden or plaster models.

Standard table sizes up to $92\frac{1}{2}" \times 25\frac{1}{2}"$. One, two, four or six spindles.

A two spindle machine with reverse image attachment is available for immediate delivery.

SOLE U.K. DISTRIBUTORS

Write for technical brochure M/172



DOWDING & DOLL LTD

346 KENSINGTON HIGH STREET, LONDON, W 14
Tel: WESTERN 8877 (8 lines) Teles: 23182 Grams: ACCURATOOL LONDON TELEX

For *Rapid*Precision Gear Grinding



SWISS

REISHAUER

GEAR GRINDER MODEL NZA

Operating on the continuous worm generating principle, REISHAUER Gear Grinders are exceedingly rapid and precise. There are no facets and no burning of the teeth. Set-up is simple and can be performed quickly. Single gears can be ground as economically as batches. Changeover from roughing to finishing is automatic—grinding to finished size also. Tip and root modifications can be easily incorporated. Crowning can be performed—and two-way grinding. Both spur gears and spirals up to 45° can be ground—fine pitch gears from the solid. A wheel truing device is incorporated.

Work diameter \ to 11\ ?. Pitches 48 to 5DP.

Also the REISHAUER DS for lapping diamond wheel-truing tools. Other models made by REISHAUER: OZA, without truing device and ZB for gears up to $27\frac{1}{2}''$ dia. $3\frac{1}{2}$ DP.

Send for the fully illustrated brochure M/198.

SOLE U.K. DISTRIBUTORS:



me

00°

172

DOWDING & DOLL LTD

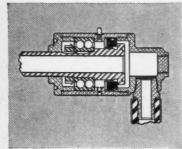
346 KENSINGTON HIGH STREET, LONDON, W.14

Tel: WESTERN 8877 (8 lines) Telex: 23182 Grams. ACCURATOOL LONDON TELE)

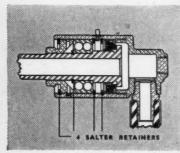
How costs are cut with SALTER RETAINERS

Salter retainers simplify design of air, water, steam union, with great savings





THE OLD WAY Air, water, steam union involved drilling, threading and milling operations. Maintenance was difficult.



THE SALTER WAY Salter retainers permit rapid, simple assembly and maintenance with a reduction in manufacturing costs.

MATERIALS SAVED

2/91 decreased wall thickness of housing eliminated bearing lock nut and washer

MACHINE **OPERATIONS ELIMINATED**

bore, undercut, and tap cap end of housing locate cap on arbor and chase threads

drill spanner wrench holes

mill slot in thread for tang on lock washer

drill spanner wrench holes in rotor

cut thread on rotor for lock nut

ASSEMBLY **OPERATIONS ELIMINATED**

install lock washer, tighten lock nut, bendlug assemble cap into housing

TOTAL SAVING WITH SALTER RETAINERS

4 SALTER

RETAINERS

1/43 1/simplify

71

design,

assembly

71 and 41 maintenance

> with a saving of

8/6½ per unit

NEATER - MORE POSITIVE - PERMANENT RETAINING

8/61

SALTER





Circlips



Fasteners



Retainers



Geo. Salter & Co. Ltd., West Bromwich. Spring Specialists since 1760

nce

unit

NG



Co-ordinated equipment for maximum efficiency on gear shaving

All your gear shaving and testing equipment from one organisation. The perfect relationship in design and performance giving peak efficiency at every stage. That's the ideal for best results. And that's what you get when you buy David Brown gear shaving and measuring equipment. David Brown are ready to prove it!

DAVID BROWN



THE DAVID BROWN CORPORATION (SALES) LTD.

MACHINE TOOL DIVISION, BRITANNIA WORKS, SHERBORNE STREET, MANCHESTER 3. Telephone: BLACKFRIARS 4711

TOOL DIVISION, PARK WORKS, HUDDERSFIELD.
Telephone: HUDDERSFIELD 3500

OA/6409A

INNOCENTI

Maximum power, precision and production potential

are essential characteristics of INNOCENTI-CWB Milling and Boring Machines Additional important features: Maximum versatility: Economical production: Jig boring facilities: Large diameter surfacing and boring at right angles to main spindle: D.C.-variable speed motors: Silding headstock: Virtual elimination of boring bars: Facilities for copying: Facilities for automatic remote control electric

measuring and for programme control: All-electric — no electronics: Minimum maintenance: Remote pendant control of entire machine.

Machining of slots on hydraulic rofor body on INNOCENTI-CWB FAF 305/200 machine using high precision rotary Indexing, milling and turning table. Note stops for automatic indexing.

INNOCENTI

Inserted by Henderson & Keay Ltd.,
Agents in Great Britain for INNOCENTI Mechanical Division, Milan

HENDERSON & KEAY LTD.

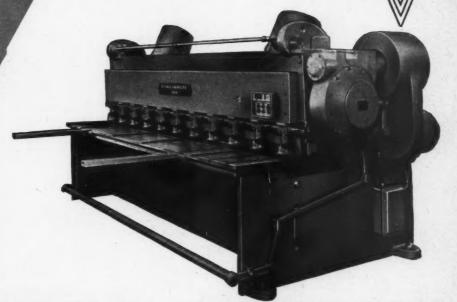
189 PITT STREET . GLASGOW'C.2

Telephone: CENTRAL 0261

Cuts to micrometer accuracy



CINCINNAT



BRITISH BUILT... CINCINNATI SHEARS

. . AND BRITISH MADE

CINCINNATI

all steel

PRESS BRAKES

1961



. . FOREMOST IN THE FIELD

Accurate, high speed production is ensured with all-steel interlocked construction, inclined ram, hydraulic holdowns and front-controlled back gauge.

BUILT TO PRECISION MACHINE TOOL STANDARDS

E. H. JONES

(MACHINE TOOLS) LIMITED

GARANTOOLS HOUSE

Triegrams Gazantools, Portslade

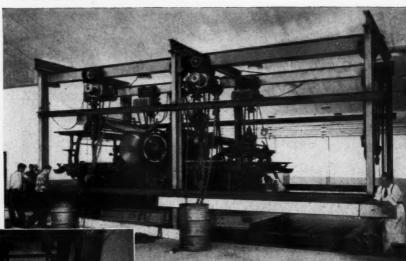
BIRMINGHAM

GLASGOW

MANCHESTER

BRISTOL

A BIG LIFT!





by WARDS F.P.I. Department

28 Two-revolution Flat-bed Printing Presses (the largest weighing approximately 24 tons) were transferred 50 feet from ground to top floor level at Odhams (Watford) Ltd., new factory extension. These were lifted with a minimum of dismantling and with a loss of working time of less than one week per machine.

FOR ALL MACHINERY MOVEMENT AND INSTALLATION IT PAYS TO CONSULT WARDS!

THOS. W. WARD LTD

FACTORY PLANNING AND INSTALLATION DEPARTMENT

ALBION WORKS · SHEFFIELD
Phone: 26311 (Ext. 201) Groms: "Forward, Sheffield"

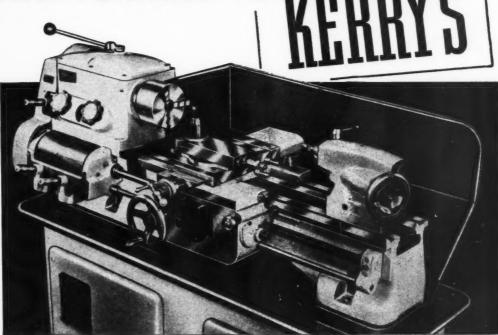
LONDON OFFICE: BRETTENHAM HOUSE LANCASTER PLACE STRAND W.C.Z. PHONE: TEM. ISIS

FP1-26

When answering advertisements kindly mention MACHINERY.



MORE AND MORE ARE TURNING TO



11" SWING LATHES

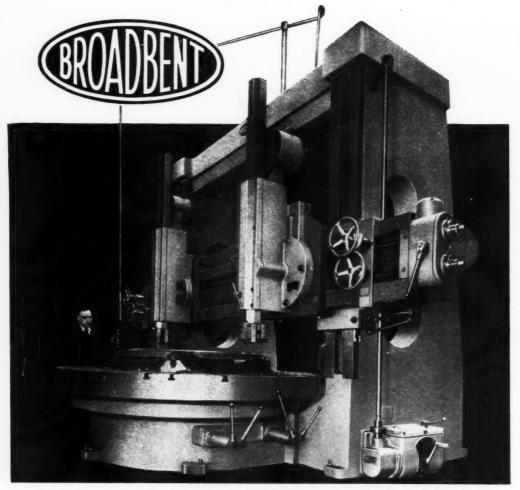
THOUSANDS in use in Great Britain and throughout the World!

- * SLIDING, SURFACING AND SCREWCUTTING LATHE
- ★ ALL GEARED HEADSTOCK GIVING 9 SPEEDS RANGING FROM 39-1500 r.p.m.
- ★ TYPE LOO PRECISION TAPERED SPINDLE NOSE
- ★ FEED BOX GIVES 64 PITCHES AND 7 FEEDS FROM 0004 in. 024 in.
- * CAMLOCK TAILSTOCK
- * BEDWAYS AND SLIDES PRECISION GROUND
- * HARDENED BEDWAYS OPTIONAL EXTRA

KERRY'S

manufactured within the KERRY GROUP by KERRY'S (Engineering) CO. LTD GRANGE ROAD, LEYTON, LONDON, E.10





HEAVY DUTY Vertical BORING & TURNING MILLS

with 5, 6, 8 or 10 ft diameter work tables

These incomparable machines are massively constructed for years of hard service. Accuracy and dependability are of the high order that industry has learned to expect of Broadbent Machine Tools. Notable features of these Boring and Turning Mills include twelve changes of speed and six changes of feed, controllable from either side of the machine; spiral bevel and spur reduction gears driving the work table; pendant control of rams and cross slides; and rapid power traverse with independent control of the two heads.

Please write for fully illustrated brochure.



manufactured within the KERRY GROUP by HENRY BROADEENT LIMITED SOWERBY BRIDGE, YORKSHIRE







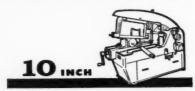
OLDFIELD & SCHOFIELD CO. LTD
BOOTHTOWN, HALIFAX, YORKSHIRE

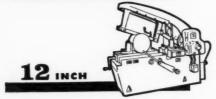


Sales Office: WARTON ROAD, STRATFORD, LONDON, E.15. Telephone: MARyland 6611









Full details from your machine tool merchant or our Sales Office



SAWMASTERS

are the finest **HEAVY DUTY HACKSAWS** in the world

Modern in design, robust and precise in construction, these unrivalled machine saws cut accurately and rapidly, and offer maximum production efficiency. Refinements include totally enclosed drive, hydraulic relief on the return stroke and automatic lifting of the bowslide to loading position on completion of cut.

Instant lever selection of correct cutting speed is a feature of all but the smallest model.

-and the famous SAWMASTER Autocut Power Bandsaw.



manufactured within the KERRY GROUP by QUALTERS & SMITH BROS. LTD BARNSLEY, YORKSHIRE



S

ion, and ney. ulic g of cut.

saw.

THE

1611 y/Q58



Vertical or horizontal, streamlined or functional



This new Holroyd 2½" centres motorised worm gear speed reducer has been designed to meet the need for a self-contained drive suitable for continuous use, and one which will look right in any surroundings. No matter what the application, it is possible to select from its variety of assemblies and mounting positions, an arrangement which makes it appear an integral part of the surrounding machinery, and not an added afterthought.

The Verso has all the famous features of Holroyd reliability and high efficiency. Centrifugally cast Holfos wormwheel; casehardened and profile ground alloy steel worm; ball bearings throughout; rigid cast iron casing and oil bath lubrication requiring no attention over long periods. Output speeds are from 14 to 300 rpm. Output torques up to 750 lb. ins. Standard motors from ½ up to 2 hp. Please write for catalogue V. 60 which gives further technical information.





Holroyd



Impregnation Process for Porous Castings

THE NEW MOGUL

CAST SEAL PROCESS

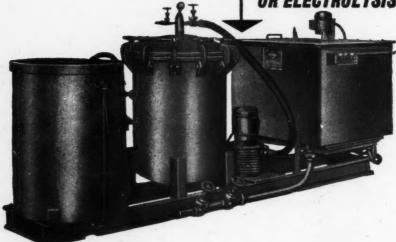
IMPREGNATES CASTINGS

WITHOUT BAKING

WITHOUT DISCOLOURATION

WITHOUT RUSTING

OR ELECTROLYSIS



The MOGUL CAST-SEAL Impregnating Process utilises a metallic colloidal solution, which is pressurised round and through the castings and permanently seals leaking and porous places. The solution penetrates into the leaks and builds up a metallic seal right through the wall.

Ferrous and non-ferrous castings can be treated in 45 minutes without preparation (other than de-greasing where necessary) and do not require subsequent baking or cleaning. The process does not affect the appearance of the castings in any way.

An Impregnating service to the trade is operated at Sheffield.

Patented by the Metallizing Company of America.

Manufactured in France by the RONCERAY Group of Companies.

BRITISH RONCERAY LIMITED
14, WOLSELEY ROAD, SHEFFIELD, 8



Telephone: 54108

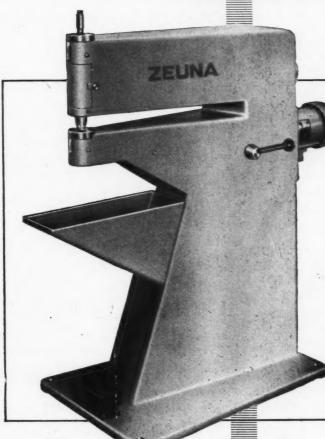
Telegrams: Bronceray Phone Sheffield 8

OA/2346

ZEUNA

MACHINERY

Combined NIBBLING MACHINE



- The combined machine consists of a cantilever upper nibbling arm and a lower counteracting arm, both having a common drive.
- Permits the machining of metal sheets and bands of any length and width.
- The novel mounting of the holding down device makes it possible to cut a minimum inside radius of 0.32in. as well as any cutside radius or acute angle; it even enables swivelling on the spot.
- Will cut any shape out of the centre of a metal sheet.
- The advantage of the counteracting lower arm consists in the narrowness of the cutting track. Cutting widths of 0.24 to 0.40in. can be obtained by merely inter-changing the upper and lower dies. Such narrow tracks are often required for the cutting of slots.
- Steel sheets of a thickness of up to 0.10in, can be cut with 700 strokes/minute and the upper and lower dies can be easily reground.



Modern Machine Tools Ltd P. O. BOX 56 GOSFORD STREET COVENTRY

> Telephone: Coventry 22132/6 Cables: 'Modern' Coventry





HIGH PRECISION
Small-Bore Gauge
DIATEST Gauges are the
solution to your checking
problems!

NO MORE TROUBLE GAUGING

blind bores, tapered bores, incomplete bores, barrel-shaped bores, out-of-round bores, where other bores interfere

DIATEST Gauges can be operated by unskilled labour.

DIATEST Unit Heads are hard chromium plated to withstand wear.

Minimum Bore - - 0.039in. Readings in - - - 0.000lin. Range - - - 0.039in.-12.000in.

ALL PARTS INTERCHANGEABLE

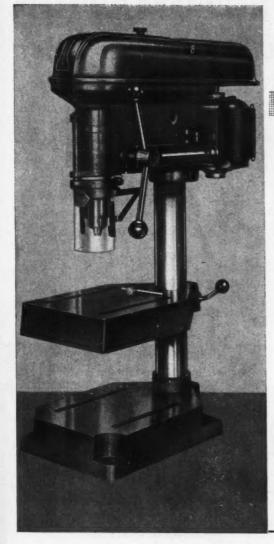
WRITE FOR COMPLETE DETAILS TO THE SOLE IMPORTERS



MICHAEL S. THOMPSON LTD.



185, HAMMERSMITH RD., LONDON, W.6, ENGLAND. TELEPHONE RIVerside 7922/3 TELEGRAMS TOMTOOL, LONDON, W.6.



INCOMPARABLE

IN PRICE & QUALITY

- Weight 154 lbs. 70 kgs.
- Five Spindle Speeds
- Throat Depth $7\frac{5}{8}$ ": 194 mm
- Column Diameter 2¾": 70 mm
- Quill Diameter 2": 50.8 mm
- Robust Spindle and Quill Assembly with splined spindle and driving sleeve
- Large working surface to table and base
- Adjustable Depth Stop and Spring-controlled Spindle return

Supplied complete with o-½in. Chuck, 3 phase motor, rotary on/off starter. Pedestal model £2.15.0 Extra. Single phase electrics £2.10.0 Extra.

£42

MEDDINGS KIL TK

W. J. MEDDINGS LTD

IPSWICH ROAD, TRADING ESTATE, SLOUGH, BUCKS.
Telephone: Slough 26761 Telegrams: Pacera Slough

Obtainable from all leading Machine Tool Merchants, or write to us for details of your nearest stockist.

When answering advertisements kindly mention MACHINERY.

rfere

5, 1961

gè

he ing

r. rd nd

39in. Olin. 00in.

MD.

AND.

PNEUTOMATION

Gives a further prod to production SQUINCH .

DOES IT

AGAIN

The last time we increased our prices was

In the intervening period we have, through increased and more efficient production, absorbed six National wage awards and a reduction in working hours

SOUINCH does not intend to increase his prices

regardless of what other people are doing Registered

ED WITH DESOUTTER BROTHERS (HOLDINGS) LTD.

OWEN ROAD WOLVERHAMPTON ENGLAND

Telephone Wolverhampton 25221-2-3-4 Telex No. 33193

Fully Automatic Cycle plus

crush formed full profile wheels

The most advanced machine of its class, the fully automatic Magerle is designed both for surface grinding and high production profile work.

By the Magerle method, crush formed work is now produced as easily as surface grinding. Let us send you full particulars on this versatile, high precision machine.



MÄGERLE

PRODUCTION PROFILE GRINDER

- Constant peripheral wheel speed.
- Auto-sizing within 0.0002in.
- Auto compensation for wheel wear through dressing.
- Table sizes from 294in. by 97kin. to 494in. by 97in.



SPLINE SHAFT

GRINDING TIME PER PIECE 2 min. ACCURACY OF FORM 0.0002in. DEPTH OF PROFILE 0.04in. STOCK REMOVAL 0-012in. MATERIAL E.C.N. 35.

STON E.MARBAIX LTD.

NRP 3423A

DEVONSHIRE HOUSE, VICARAGE CRESCENT, BATTERSEA, LONDON, S.W.II Phone: BATtersea 8888 (8 lines)

When answering advertisements kindly mention MACHINERY.

AND

P. 6235

A SUCCESSFUL LAUNCHING



LAUNCHING OF THE NEW ELIZABETHAN LINE "GLORIANIANA"

LAUNCHING OF THE NEW ELIZABETHAN LINE "GLORIANIANA".

Lettraright: A. Daley-Noggin (Director), The Hon. Percy Veerying (Director), Lord Lummer (Charman), H. H. The Ali Mhin-Yum, K. G. C. L.
Lady Phyllis Glassup⁴, Field Marshal Lary, K.V. C.O., G.C. E., Commander Ivan Astikoff (Naval Attacke, Slobovia), D.d. L. Dick, O.B. L. T.

* incho was, of course, Miss Elsa Pappin before her brilliant marriage earlier this year to Lord Buny's sins, Toppis.)

with thanks to Moss Bros.

"CONGRATULATIONS CHAIRMAN -

we saved an extra £25.000 by using

CONTINENTAL ALUMINIUM"

* Standard Continental Aluminium Theets, Sections, Tubes, etc., sell at \$20 per ton less than normal approximately according to size and quantity. Guaranteed new and to British Standard Specifications.

H. ROLLET & CO. LTD.

Depots in most major cities

New Small SCHUTTE SIX SPINDLE AUTOMATIC

MODEL SE16

INDEPENDENT CROSS & LONGITUDINAL TOOL CARRIERS FOR EACH SPINDLE

Designed for the high speed production of small components.

Spindle speeds up to 5000 rpm; piece times as short as 2 secs.

Individually positioned quills carry longitudinal tools.

Full accessibility for setting.

Easy swarf clearance without stopping machine.

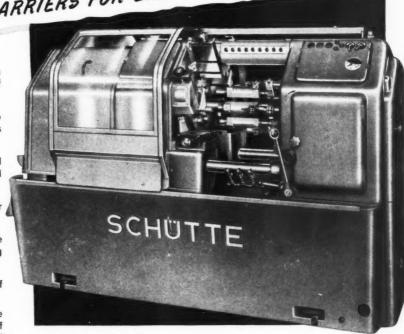
Large number of special attachments.

Components can be machined on part-off side with pick-off attachment.

Heavy construction net weight $4\frac{1}{4}$ tons.

Fully automatic lubrication.

Automatic safety devices.



EARLY DELIVERY

Maximum Bar Feed
No. of Spindle Speeds

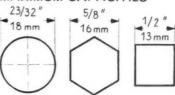
4¾″ 45

Range of Spindle Speeds 400 5000 rpm

Piece Times

eds 400 - 5000 rpm 2 - 45 secs.

MAXIMUM CAPACITIES



ROCKWELL

For further particulars write or telephone TODAY

WELSH HARP, EDGWARE RD., LONDON, N.W.2. TEL: GLADSTONE 0033

ALSO AT BIRMINGHAM - TEL: SPRINGFIELD 1134/5 - STOCKPORT - TEL: STOCKPORT 5241 - GLASGOW - TEL: MERRYLEE 2822

Confidence in



MATRIX No. 50 Optical Jig Borer

You can see this machine within easy reach of your locality

The above illustration shows one of our Machines as supplied to

The National Physical Laboratory and The National Engineering Laboratory.

Our confidence that there exists no finer example of High Precision Engineering than that embodied in the 'MATRIX' No. 50 Optical Jig Borer is confirmed by increased sales and by the large number of distinguished customers who have selected our machine for their most exacting requirements.

TABLE SIZES 24" × 36" and also now available in 24" × 42"

ROCKWELL

For further particulars write or telephone TODAY

WELSH HARP, EDGWARE RD., LONDON, N.W.2. TEL: GLADSTONE 0033

ALSO AT BIRMINGHAM -TEL: SPRINGFIELD 1134/5 . STOCKPORT -TEL: STOCKPORT 5241 . GLASGOW -TEL: MERRYLEE 2822



r

ratory ratory. recision No. 50 by the

IE 0033

E 2822



CUT PRODUCTION COSTS

Lapmaster



LAPMASTERS (12", 24", 36", 48", 72" and 84") are accurate to within one light band (*OOO0116') and produce a surface finish from 1 to 5 micro-inches or to your own requirements. They will lap from a turned face, milied face or even straight from a casting if of a precision nature.

Here's a two-way plan that will cut to a fraction the time and expense of lapping parts in steel, monel, bronze, cast iron, quartz, plastics, etc. If your production volume warrants it, invest in a LAPMASTER—an automatic precision machine for the high-speed, low-cost lapping of all materials in any quantities. It will literally pay for itself many times over in a matter of months. For smaller quantities let the LAPMASTER JOB LAPPING SERVICE look after all your lapping requirements.

Whichever method you adopt you'll get greater precision, improved product performance and a substantial reduction of your production costs.

PROOF POSITIVE!

Why not send us a batch of parts with your own accuracy specifications? We will lap them to your requirements and return them to you quickly with accurate data on production time and a cost quotation which will certainly interest and probably surprise you.

A set of technical booklets will gladly be sent on request.



PAYNE PRODUCTS INTERNATIONAL LTD

Head Office & Works: BUCKINGHAM AVENUE TRADING ESTATE · SLOUGH · BUCKS

Telephone: Slough 26741/4

Grams: Payappro, Slough

Sales, Service & Job Lapping facilities also at : Blackbraes Road, Nerston Industrial Area, East Kilbride, Glasgow. Moll Springs, Netherton, Nr. Huddersfield, Yorks.





For fast, sure gripping and quick release these ALBRECHT keyless chucks are unequalled.



Your stockist can supply
ALBRECHT keyless chucks
for light and heavy duty
precision drilling.

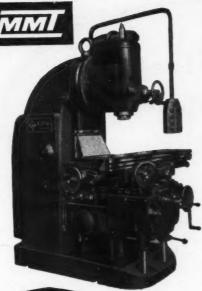


Keyless CHUCKS

Sole Agent for the U.K.

THE JACOBS MANUFACTURING CO. LTD · ARCHER ROAD · SHEFFIELD 8

JC/11



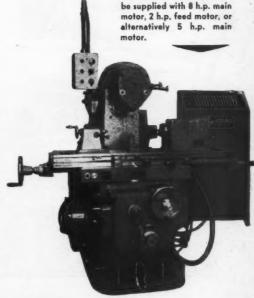
New VF.20 Vertical Milling Machine featuring the swivelling head with independent motor drive for power feed to quill, enabling power feed of quill to be obtained at any angle desired. This is a valuable feature especially in repetitive drilling and boring. Main spindle motor 15 h.p., feed motor 31 h.p., special feed motor for spindle quill 1/2 h.p.

Also world-renowned manufacturers of high precision heavy duty lathes, 45 models from 8" height of centres to 20" height of centres, 40" between centres to 120" between centres. Larger machines manufactured to special requirements.



The UF.10 illustrated with automatic cycle programme control including rise and fall of knee and indexing. All machines supplied with double front support to knee giving maximum support under the heaviest cut. Range includes universal, plain, vertical, auto-cycle

and auto-cycle programme controlled. The UF.10 can



ORTIMER

DISTRIBUTORS OF THE FINEST MACHINE TOOLS

MORTIMER MACHINE TOOL CO. LTD . MORTIMER HOUSE : ACTON LANE . LONDON NW10 Tel: ELGar 3834-5-6 When answering advertisements kindly mention MACHINERY.

Here's a stock leakage you can stop quite easily



Stocks of ferrous metals are not safe from rust damage even when your store is locked. Rusting influences penetrate bolts and bars. It takes an efficient rust preventative to give proper protection—that means RODOL. Available in many grades, RODOL is easily applied to any ferrous surface by brush dipping or spray, to give up to 6 months protection. Then you know that losses through rust are finished. The different types confer degrees of protection suited to inter-process, stores or transit needs and these are full-drying, semi-drying and non-drying forms. Write for interesting literature on this important subject.

RODOL

against rust

FLETCHER MILLER LTD., ALMA MILLS, HYDE, CHESHIRE.

Telephone: HYDE 3471 (5 LINES)

Telegrams: EMULSION, HYDE

Also at LONDON, WEST BROMWICH, NEWCASTLE-ON-TYNE, CARDIFF, GLASGOW AND BELFAST

961

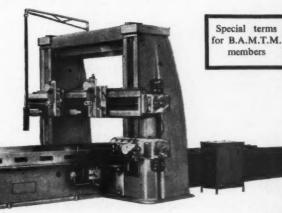
Up-to-date planing with machines of precision and sturdiness

CARNAGHI

Features include:-

- Robust construction throughout
- Massive and rigid bed
- Generously dimensioned table
- Cross rail strongly ribbed and braced to the rear of the column, with shell type section
- Electric locking for cross slide
- Plano milling heads for cross rail and side boxes available

Can be supplied with Electro magnetic clutch drive, Ward Leonard or hydraulic



Send for full details of the Carnaghi Range to :-

HERBERT WIDDOWSON & SONS LIMITED
Canal Street Works, Nottingham. Tel. 51891 (4 lines) Grams. TOOLS NOTTINGHAM



The new SICMATIC

AUTOMATIC & SEMI-AUTOMATIC HYDRAULIC PROFILING LATHES

Duplomatic Hydraulic System.
Hardened Bed Slideways.
Auto cycling up to six depths of cut.
Hydraulic tailstock for drilling and boring.
Uses template or existing component.
Eight models to choose from.

Basic price under £2,000.

SPECIFICATION

SILCIFICA	110	
Bore of spindle		2in.
Spindle nose		Sin. A.S.A.
Max. swing over bed		154in.
Max, swing over sadd		93in.
Max, length turned		27 in.
Hydraulic traverse of		
Hydraulic feed of spindle	tailst	ock 43in.
Number of feed	rates	to
copying slide		48
44		1,300 lbs.

EARLY DELIVERY

DAILY DEMONSTRATIONS AT OUR WORKS:

HERBERT WIDDOWSON & SONS LIMITED CANAL STREET WORKS NOTTINGHAM

TELEPHONE: 51891 (3 lines)

TELEGRAMS: TOOLS NOTTINGHAM

961



FOR IMMEDIATE DELIVERY.

With these salient features:-

- * Hardened and ground gears
- ★ Power feeds and Quick Power Traverse in all directions
- * Speeds up to 2,000 r.p.m.
- * Electro Magnetic Clutch
- * Backlash Eliminator

BRIEF SPECIFICATION

Table:	Working surface		48in. by	Ilin.
Table Feeds:	Longitudinal cross (without br	200)		29in. 9in.
	vertical			17 ‡ in.
Spindle:	Spindle Nose		No. 40	
	18 speeds	• •	40 t 2000 F	



STANDARD EQUIPMENT—COS-PAR Dividing Head

Vertical Milling Attachment Arbor, Front Braces Coolant Equipment etc.

Special terms for B.A.M.T.M. Members.

Price £1,825.

See the whole TEST Range at our works.

HERBERT WIDDOWSON & SONS, LIMITED

Canal Street Works, Nottingham. Tel: 51891 (4 lines) Grams: TOOLS, NOTTINGHAM



... for all cutting tools

The high production rates achieved in cutting both soft and hard materials in the modern machine shop are in a large measure attributable to the efficient use of high speed steel tools.

attributable to the efficient use of high speed steel tools.

Firth Brown high speed steels are distinguished among tool materials by their ability to develop by appropriate heat treatment an outstanding combination of the principal characteristics required in cutting tools, namely hot hardness, wear resistance and toughness, enabling them to retain their cutting ability at speeds, feeds and depths of cut.

There is a Firth Brown high speed steel for your every need
— write for Publication No. 224 (Section 7) for further details.





BROWN

ALLOY STEELMAKERS . FORGEMASTERS . STEEL FOUNDERS . HEAVY ENGINEERS

THOS.

FIRTH

LOHN

BROWN

LIMITED

SHEFFIELD

ENGLAND

1961

EERS

V M D





Automatic multi-tool lathe for high-output production

This illustration shows the Maximatic Automatic Multi-Tool Lathe turning axle swivel forgings, requiring several diameters, and facing.

Once set, a single lever operates the machine for each cycle, and high-output, accurate production is only a matter of load and unload. Adaptability in the setting of the cross-slides to a large extent governs the usefulness of a machine of this type and the Maximatic scores heavily in this respect. Each cross-slide is independently operated by flat former plates

so that adjustment to new jobs can be made easily, and by suitable setting of cams in the feed box a variety of movements can be obtained.

Maximatics are available in a range for work up to IIin. centre height by 78in. between centres. Write today for full details.

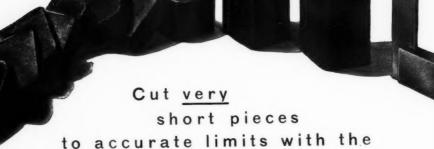
DRUMMOND BROS LTD.

GUILDFORD · ENGLAND
Member of the Asquith Machine Tool Corporation

Sales and Service for the British Isles

DRUMMOND-ASQUITH LIMITED

Member of the Asquith Machine Tool Corporation



LAMBERTON

AUTOMATIC BILLET SHEAR

Write for further details to:-

EUMUCO (ENGLAND) LTD

26 Fitzroy Square London W.1

Telephone: EUSton 4651

When answering advertisements kindly mention MACHINERY.

Smee's

n nd ROT pat Spec

E PAC

AA TH L

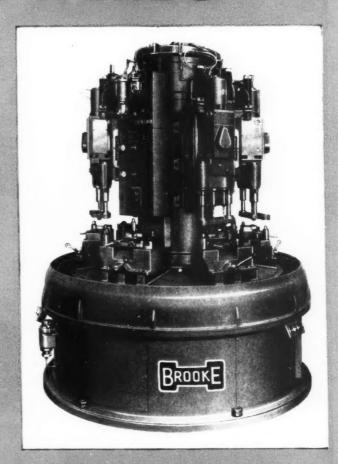
BROOKE

UNIT MACHINES AND UNIT HEADS

A new range of BROOKE Unit Heads and the new CENTRE COLUMN ROTARY INDEXING MACHINE patents applied for)

Special features on this machine include:—

- ECONOMIC USE OF FLOOR SPACE
- PATENT TABLE-CENTRALISING AND INDEXING DEVICE WHICH OBVIATES JIG-BORING
- ACCURATE TABLE SETTING BY
 AUTO-COLLIMATION
- TABLE ON AIR-FLOTATION,
 HYDRAULIC OR AIR POWERED
- LATEST BROOKE UNIT HEADS



BROOKE TOOL AUTOMATION LTD.

(MACHINE JIG & FIXTURE DIVISION)
CARDINAL WORKS, ALDRIDGE ROAD, PERRY BARR, BIRMINGHAM, 226
Tel: Birchfield 4541/2/3/4.

this is a "multisize" collet

It has a stepless gripping range of 1/8, equivalent to

the gripping capacity of at least ten spring collets. Sizes are available covering a total range from 1/16 to 2½". It is the heart of the "multisize" collet system of workholding and toolholding. All "multisize" collets in any type range are inter-

changeable.

to find out more about "multisize" write or phone:





The skill needed to send a fly skimming through the air and land just in the right place is only acquired with experience and practice. The art of making good castings is equally a matter of skill and precision.

We are specialists in the manufacture of manganese and aluminium bronze castings.

This intricate pump casting, reproduced by kind permission of Gwynnes Pumps, is cast in gun metal and weighs 7 tons



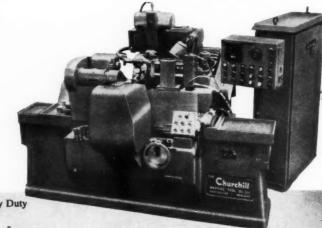
J. T. PRICE & COMPAN (BRASS & ALUMINIUM FOUNDERS) LTD. NEWCASTLE, STAFFS. Telephone, 52311-2-3

For over half a century

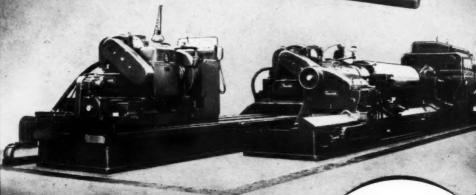
MANUFACTURERS OF

Model "BW" Automatic Plain Grinding Machine

Precision Grinding Machines



Model "TWR" 72in. x 360in. Heavy Duty Roll Grinding Machine



PRECISION PLUS PRODUCTION

THE CHURCHILL MACHINE TOOL CO. LTD.
BROADHEATH MANCHESTER

HOME SELLING AGENTS
CHARLES CHURCHILL & CO. LTD.
BIRMINGHAM and BRANCHES



EXPORT SALES ORGANISATION
ASSOCIATED BRITISH
MACHINE TOOL MAKERS LTD.
LONDON, BRANCHES and AGENTS

Churchill



A new range of self-contained units

These motors, which are manufactured in conjunction with Grantham Electrical Engineering Company Ltd., eliminate all parts associated with eccentric shaft arrangements and can be used wherever a vibrating motion is required.

Vibration is generated by out-of-balance weights at each end of the motor and single-bolt adjustment gives outputs up to 7,760 lb. centrifugal force at 1,500 r.p.m.

The totally-enclosed, dust-proof and weather-proof motor is suitable for operation on 3-phase, 50-cycle supply at 100-650 volts, but other outputs and supply frequencies can be provided for. It is built to BS.2613 with Class E insulation on the windings. The heavy duty bearings are lubricated for life.

Suitable for

Feeders

Hoppers Foundry Shakeouts Screens Bucket Cleaners Conveyors Packing Tables Tampers Confectionery Moul

Confectionery Moulds
Vibratory Massage Machines

For technical details, write for Publication DM/270 to:

The ENGLISH ELECTRIC Company Limited, Industrial Motor Works, Bradford.

'ENGLISH ELECTRIC'

vibrator drive motors

THE ENGLISH ELECTRIC COMPANY LIMITED, ENGLISH ELECTRIC HOUSE, STRAND, LONDON, W.C.2

WORKS: STAFFORD · PRESTON · RUGBY · BRADFORD · LIVERPOOL · ACCRINGTON



SMOOTHS OFF THE SWAGED OR RAISED METAL SURROUNDING TOOTH NICKS

MATERIALLY IM . PROVES SURFACE CORRECTS MINOR HEAT TREATMENT DISTORTIONS IN TOOTH PROFILE TOOTH SPACING. LEAD AND PITCH

ELIMINATES BURRS

Prior to the introduction of the "RED RING" Gear Tooth Honing Process in 1956 the only feasible means of correcting noise-producing nicks and burrs in gear teeth, required costly hand operations. Each affected gear had to be discovered and processed individually. Today gear tooth honing does the job on a fast mass-production basis at a small fraction of the former cost.

HONING PRINCIPLE

The honing tool, in the form of a gear, is composed of an abrasive impregnated material. This tool is meshed with the work gear in a crossed axis relationship. The tool is then operated in both directions of rotation while the work gear is reciprocated across its face in a path parallel with the gear's axis. Thus, all working surfaces of the gear teeth are subjected to honing action in accordance with true honing procedure.

NEW 'RED RING' MACHINE MODEL GHD

Several years of continuous gear honing experience under widely varying conditions have brought the honing process as a whole into clearer perspective. Among other things, it has emphasised the importance of selective pressure control between work and tool. As a result of these findings, a new and considerably more versatile "RED RING" Gear Honing Machine (Mod GHD) has now become available. In addition to increased versatility, it is smaller, more compact than its predecessor and is lower in cost.

SPUR AND HELICAL GEAR SPECIALISTS ORIGINATORS OF ROTARY SHAVING AND ELLIPTOID TOOTH FORM

PRECISION GEAR MACHINES AND TOOLS LIMITED

(An Associate Company of National Broach & Machine Co., Detroit, U.S.A.)
World's Largest Producer of Gear Shaving Equipment

RED RING WORKS, BODMIN ROAD, WYKEN, COVENTRY

Telephone: Walsgrave-on-Sowe 2372 Telegrams: Pregearmac Coventry

961



Manufacturers of

HOT ROLLED STEEL STRIP

MILD STEELS supplied in coils up to 125 lbs. per inch of width or in Cut lengths. Quick delivery.

Widths: 34' to 17'.
Thickness - varies with width (up to 4' in the wider widths).

Thickness Over 154" to 17" S.W.G. 10
according to width: Over 11" to 154" 12
to width: Over 64" to 9" 14
Over 54" to 64" 15

Over 54" to 64" 15 Over 34" to 54" 16

Also Special Steels.
Write for leaflet showing full range.

Ring SHEFFIELD 387272 extension 290 for prompt attention

Sales and Administrative Offices:

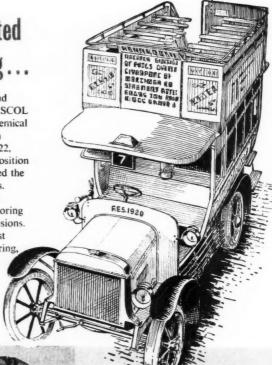
Trubrite Steel Works, Meadow Hall, Sheffield

Stafford House, 40/43 Norfolk Street, Strand, London W.C.2. Tel. Temple Bar 7187 Rushin Buildings, 191 Corporation Street. Birmingham 4. Tel. Central 6801

Fescol certainly started more than something...

When London's buses looked like this and catered more for health than comfort FESCOL pioneered their process for the electro-chemical deposition of nickel for building up worn engineering parts. Two years later, in 1922, FESCOL again led the way with the deposition of hard chromium and have now perfected the deposition of hard chrome on light alloys. The FESCOL process has saved industry hundreds of thousands of pounds by restoring worn components to their original dimensions. The process protects new products against corrosion and provides a hard, long-wearing low-friction surface. Are you up-to-date with the full range of engineering components that can be FESCOL-ized in Chrome or Nickel?

For further information please write for publication M19.





1 ST HEAVY NICKEL DEPOSITION was pioneered by FESCOL in 1920

1 ST HARD CHROME DEPOSITION was introduced by FESCOL in 1922

NOW HARD CHROME DIRECT ON LIGHT ALLOYS



FESCOL LTD · NORTH ROAD · LONDON N.7

Branch Works at

Port Glasgow, Huddersfield, and Brownhills, Walsall

Licensees in France, Australia, New Zealand, Italy, South Africa, S. W. Africa, Rhodesia and Nyasaland.

aland.

A 960



MACHINES

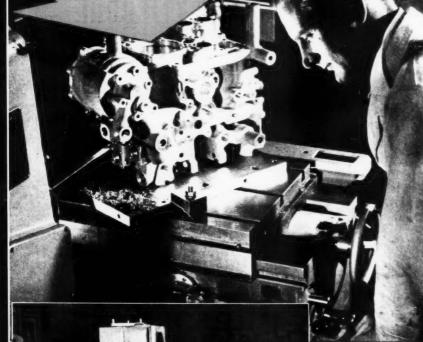
B. O. MORRIS LTD. . MORRISFLEX WORKS, BRITON ROAD . COVENTRY

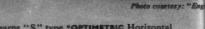
Telephone: 53333 (PBX)

Telegrams: MORISFLEX, COVENTRY

PRODUCT OF THE MOTORIES GROUP

serving industry well...





A Kearns "S" type "OPTIMETRIC Horizontal Tool-Room Boring Machine machining the main body of an aircraft gas turbine fuel control unit at Dowty Fuel Systems Limited.

The casting being machined has...

60 main bores to fine limits 20 recess chambers in the main bores 120 drilled and tapped holes

Left: Recently supplied to Dowty Fuel Systems Limited, a Kearns "S" type *OFTIMETRIC Horizontal Tool-room Boring Machine, High-Speed, Spindle Model.

OPTIMETRIC is the registered trade mark of Kearns system of optical measurement fitted as standard to all Kearns Horizontal Toolroom Boring Machines.



...Dowty depend on KEARNS

H. W. KEARNS & CO LIMITED BROADHEATH BEAR MANCHESTER

esy: "Engi

rol

18

SIE





to mill the columns of the FORTH ROAD BRIDGE



THE [MATERIAL—high tensile structural steel.

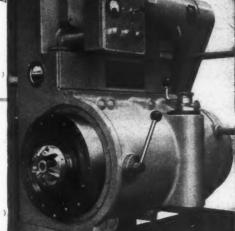
COLUMN SIZE—47ft. 6in. $long \times 9ft.$ 6in. \times 5 ft. THE MACHINED AREA—9ft. 6in. \times 5ft.

THE DEPTH OF CUT—approximate' in. using a 3in. dia. Type FM45 FUTURMILL.

FEED RATE-60in. using 'PROLITE' GRADE 20K

The Prolite-Futurmill FM45 is a cutter of unique design using throw-away blades which give improved performance, lower production costs, and longer cutter life. Our engineers are available at any time for consultation and demonstration in your works.

Photographs by courtesy of Sir William Arrol & Co. Limited, and Clifton & Baird Ltd., designers and builders of the machine.



Mone: Salet: PROTOLITE LIMITED (a subsidiary company of Auren, Led.): RAINMAP, ESSEX.

Telephone: Rainham, Essex 3322 Telax: 28632. Telegrams: Protalite, Rainham-Dagenham Talex.

Southern Area Office: Central House, Upper Wobern Place, Leadon, WCI. Northern Fives, Office: Norwich Union Suitaings, City Square, Leads!

Middend Area Office: Gulldhall Suitdings, Navigation, Street, Blemingham 2.

Export Sales: MURBX LIMITED (Proder Metallurgy Dichlon), SAINMAM ESSEX, ENGLAND,

Telephone: Rainham, Essex 3222. Telex: 28632. Telegrams: Murex, Mainham-Dagenham Talex.

WOHHERS

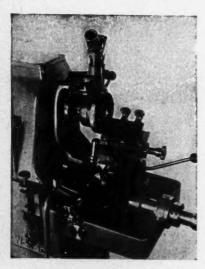
FOR HIGH PRODUCTION

INTERNAL & EXTERNAL LAPPING

MODEL JLI HYDRAULIC INTERNAL LAPPING MACHINE

TOLERANCES WITHIN -00004in. SURFACE FINISH 1_MICRO INCH LOR LESS For high production lapping of bores from fin. to 2ir. dia. Hydraulic operation gives infinitely variable speeds and smooth, shock-free operation. Combined floating of the work fixture and the lap, plus precisely controlled lap expansion, result in unsurpassed finish and accuracy.

Available with Automatic Lap Expansion



MODEL ST2. CARBIDE TOOL SUPERFINISHING & LAPPING MACHINE

Complete face of tools rough and finish lapped in one mounting. Two laps are coaxially mounted so that tools are roughed and finished at precisely the same setting. Fixtures available for all types of tools, also chip-breaker grooving.

Sole Agents





MODEL 2U8 EXTERNAL AND FLAT LAPPING MACHINE

Independent drive to upper and lower plates, also to centre drive for work carrier to give full epicyclic action resulting in extreme accuracy with high production. Upper plate swings completely clear to give easy loading.

LET US DEMONSTRATE TO YOU

YAUGHAN HOUSE, 4 QUEEN STREET, CURZON STREET, LONDON, W.I

Telephone: GROSVENOR 8362-5

Midland Office: WILFORD CRESCENT, NOTTINGHAM

Telephone: NOTTINGHAM 88008



"These Wild-Barfield furnaces do a really good job"

Where heat-treatment is concerned—are you doing the job as economically as possible? It's surprising the number of people who invest in expensive machine tools for production—and then spoil a good job in outdated furnaces. And the result? Rejects—time, money and probably customer goodwill lost. More and more people are relying on Wild-Barfield equipment. Write for full details and see how you can save by changing to modern electric furnaces.

Self-contained Electrode Salt Bath ESB 346.
Standard Model delivery ex stocks



drive

letely

REET,

HAM

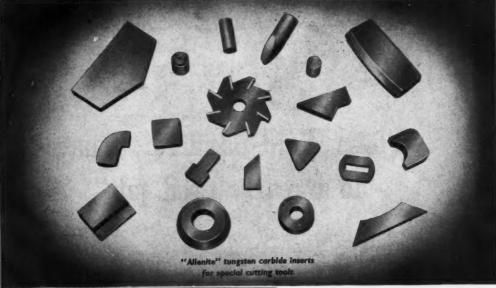


ELECTRIC FURNACES

FOR ALL HEAT TREATMENT PURPOSES
Backed by 40 years specialist experience

WILD-BARFIELD ELECTRIC FURNACES LIMITED

ELECFURN WORKS, OTTERSPOOL WAY, WATFORD BY-PASS, WATFORD, HERTS. Tel: Watford 26091 (8 lines) Grams: Elecfurn, Watford



for outstanding performances
"Allenite"

Tungsten Carbide
Tipped Tools and Tips

The research'which Edgar Allen have put into their manufacture of Stag 'Allenite' tungsten carbide cutting materials, including the addition of special elements to modify and improve their characteristics, has resulted in a range which gives outstanding performances in high-speed production with long tool life between grinds.

A complete range of standard tool tips has been evolved which our experience indicates as best meeting users' requirements; full particulars given in Publication 58K. In addition we are always willing to quote for special types to customers' own drawings—some of these are shown in the illustration above.

10 different grades of Stag 'Allenite' are made to meet applications which include cutting, percussive drilling, wear and abrasion resistance, chemical inertness, etc. We are at all times willing to advise, as care in choosing the right grade ensures the best possible results in machining steels, cast iron, non-ferrous metals, plastics, glass etc.

EDGAR ALLEN & CO. LIMITED IMPERIAL STEEL WORKS SHEFFIELD 9.

"Allenite"
PLOWRAKE and PLOWCAST Tools



The success of Plowrake tools in planing steel led to a demand for similar tools for planing cast iron. Plowcast tools will stand up better than any in planing cast iron, especially with interrupted cutting or on machines not in the best of condition.

 . . < . . . < . . . < . . . < . . . < . . . < . . . <

> - - > - - - > - - - > - - - > - - > - - > -

sensitive accurate simple.

light trouble-free

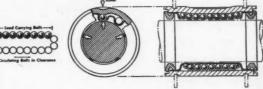
ROM BALL BUSHINGS



bring new precision to linear motion

Just as you specify rolling bearings for rotary motion, so these **R** & **M** Ball Bushings bring you equivalent performance for linear movement. The self-contained re-circulating ball principle provides a neat compact unit as easy to handle and install as a plain bush. Leading companies in America have proved the value of Thomson Ball Bushings. Now they are made in Britain by Ransome and Marles Bearing Company under U.K. patent 707039.

Ball Bushings are fully described in **R** & **M** publication 76. If you have linear motion, then you need a copy.





Sole concessionaires for Great Britain and the Commonwealth

RANSOME & MARLES BEARING COMPANY LIMITED

NEWARK-ON-TRENT · NOTTS · TELEPHONE 456 · TELEX 37-626

Jones - Shipman

Production Gylindrical **Grinders**

PLAIN & SEMI-UNIVERSAL MODELS

These are truly precision machines, designed and built for continuous production grinding but sensitive enough to give results to toolroom standards. The independent controls can be interlocked to give one-lever control.

Built in a range of sizes to give grinding capacities from 8in. dia. x 18in. up to 10in. dia. × 60in.



A. A. JONES & SHIPMAN LTD.

LEICESTER. Telephone: Leicester 823222

London Office: 50/52 Great Peter Street, London, S.W.I. Telephone: Abbey 5908/9.







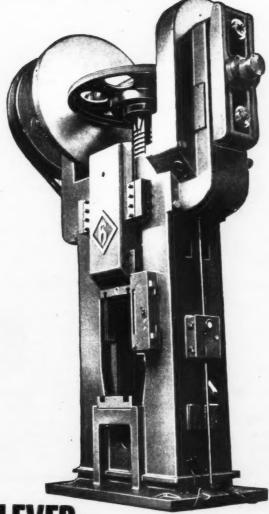
Hydraulics



H. S. CATTERMOLE & CO. (NYDRAULICE) LTC.

HYDRAULIC, GENERAL ENGINEERS & CONSULTANTS FECKENHAM ROAD, ASTWOOD BANK, Nr. REDDITCH, WORCS, Telephone: Astwood Bank 142-3

REMEMBER! IT'S PAUL GRANBY



HASENCLEVER Friction Screw Presses

with electronic variable blow selector



PAUL CHAMBY ACCLED

REVLAC

INDEXING FIXTURES

INDEXING COLLET CHUCK 17762

For multiple gang-milling, slot grinding, etc. Can be mounted on lathe and used as collet turning fixture. Fits standard collets up to lin. bore.

2, 3, 4 and 6 index stations. Fitted with dead length stop. Indexes and locks with same lever. All working parts hardened and ground.





10in. DIAMETER INDEXING TABLE 17767-

Used as a standard indexing base in the machine shop. Very low working heights. Very heavy duty. All working parts hardened and ground. Can be indexed and locked with same lever. Fitted with 2, 3, 4, 6 and 8 positions. Special indexes can be arranged to suit.

-HORIZONTAL DIVIDING HEAD WITH TAIL STOCK 17765

Will perform practically all indexing operations on splines, all forms of shafts, keyway operations, fluting and serrations. Exceptionally robust and strong. Very suitable for continuous spline milling or grinding where accuracy is important. Fitted with 2, 3, 4, 6 and 8 positions. Indexes and locks with same lever, working parts hardened and ground.





INDEXING TABLE 17763-

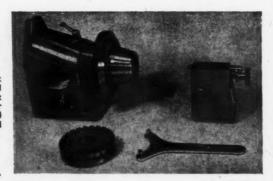
For jig boring, end-milling, surface grinding, radial drilling. Designed to take aub fixtures and be used as standard indexing base. Indexes and locks with same lever. Table and all working parts specially hardened and ground.

2. 3. 4 and 6 index stations.

THE REVLAC KINGDEX PRECISION DIVIDING HEAD No. 17764

Can be used as a Dividing Head or Collet Fixture in the Vertical or Horizontal Plane. Supplied with two sets of Index and masking plates with Irregular or regular positions within 20 or 24 landexes. All working parts hardened and ground.

C.M.G. CALVER Ltd.



HIGH STREET · BUSHEY · HERTS Phone: BUSHEY HEATH 1318 and 2555

When answering advertisements kindly mention MACHINERY.







MULTIMATIC

Automatic MACHINES and UNITS for rotary, in-line or single unit application

flexibility
is the keynote

INDEXING
DRILLING
TAPPING
SLITTING
BAR FEEDING and
PARTING-OFF



MACHINE SHOP EQUIPMENT LTD

SPENSER STREET, LONDON, S.W.I.

Telephone: VICtoria 6086



MULTIPIERGING
AND
NOTCHING
NOW
POSSIBLE
WITHOUT
SPECIAL
PRESS
TOOLS!!

REDMAN

UNITOOL SYSTEM

With Redman UNIPIERCE and UNICROP units, multi-punching and notching set-ups can be quickly positioned on baseplates, thus not only enabling production to start without delay, but also saving the cost of special tools. Catalogue UP/1002/M3 on request.

REDMAN TOOLS & PRODUCTS LTD., Box No. M.3, Gregory's Bank, Worcester.
Telephone: Worcester 2003 (4 lines) 'Grame: Rodpoole, Worcester. Northern Agents: Dunmes Ltd.,
123 Hope Street, Glasgow, C.3. Telephone: Glasgow, Control 0421/2.



CHATWIN

for 100 per cent accuracy

> in making form tool cutters of all types. We have over a century of experience in precision engineering, and Non-standard flat and spherical form cutters are our speciality.

Look for Chatwin. The name for a guarantee in precision and accuracy.

Write for a copy of the new Chatwin Small Tools Catalogue

THOMAS CHATWIN & CO. Great Tindal Street, Birmingham 16. Phone: Edgbaston 3521.

> Area Offices: LONDON BRISTOL NEWCASTLE-upon-Tyne MANCHESTER

When answering advertisements kindly mention MACHINERY.

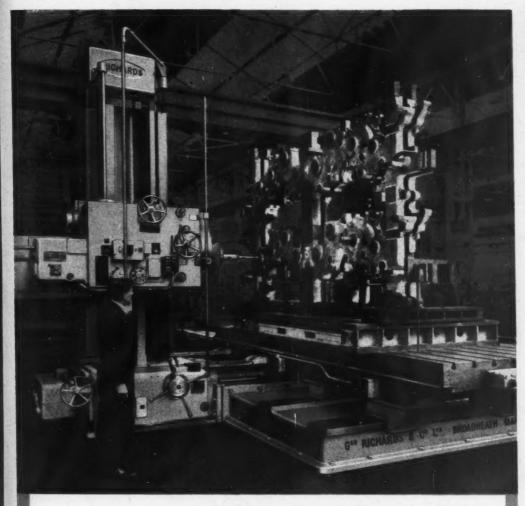
THOMAS CHATWIN & CO.

of all tury iginand our

for

:o.





Illustrated above is a Richards Wide Bed Type Horizontal Boring, Facing and Milling Machine, with Traversing Spindle, in plant at the Preston works of the Goss Printing Press Co. Ltd. The machine is shown boring and facing the side frames of a printing machine, and has an 18ft. Oin. wide bed, a 15ft. Oin. by 6ft. Oin. sliding table, fitsed with optical scale projectors.

Further details of any of the wide range of Richards Machines are given in pamphtess, copies of which will be gladly sent on request.

Wide value of the machine is representative of a full range of Horizontal Boring, The machine is representative of a full range of Horizontal Boring, Facing and Milling Machiness, which include Table. Wide Bed, Saddle Facing and Milling Machiness, which include Table. Wide Bed, Saddle Support, Floor and Planer types, supplied with and without traversing spindle. The range can be further increased with combinations of extended height, bed length and width, and table size if required.

RIGHARDS

GEORGE RICHARDS & CO. LTD. BROADHEATH ALTRINCHAM CHESHIRE

Telephone: ALTRINCHAM 4242 (9 lines) Telegrams: RICHARDS, ALTRINCHAM

A Member of the Stayeley Coal & Iron Co. Ltd. Group

RIJ9C

Sole Agents: ALFRED HERBERT LTD. · FACTORED DIVISION · COVENTRY

GOOD TEETH...



Heredity

emman, and the second

RACKS

To any length Maximum DP 5

WEEKS AND WILSON LTD.

GEARS AND GEAR CUTTING

581, GREEN LANES, HARRINGAY, LONDON. N. 8. TEL: FITZROY 0055-6

HAYCCK

STANDARD & SPECIAL

also

SCREW PLUG & RING GAUGES

FORM TOOLS

JIGS & FIXTURES

PRESS TOOLS

SPECIAL PURPOS

GROUND THREAD TAI

HAYCOCK GAUGE & TOOL CO. LTD, Brays Lane, Coventry, England. Telephone 53368 (3 lines)

When answering advertisements kindly mention MACHINERY.

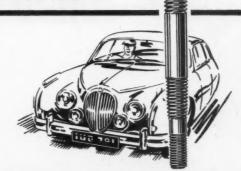
experience co

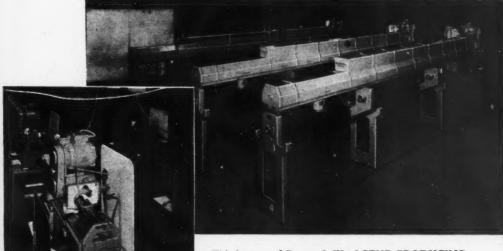


To PRODUCE COMPONENTS like this

JAGUAR cars choose

BROWN & WARD





This battery of Brown & Ward STUD PRODUCING AUTOMATICS has recently been installed by Jaguar Cars Ltd., at their Coventry fictory. Working in conjunction with Brown & Ward AUTOMATIC MAGAZINE BAR FEEDS these precision machines

are producing components, like the thread d stud shown above, at miximum output and to the exacting standards required by Jaguars. The simplicity of these machines and equipment ensures reliability, and consequently a high productive efficiency, a fact which has been proved by the large numbers of machines installed in this and many other countries throughout the world.



Selling Agents in the U.K.: ALFRED HERBERT LTD., COVENTRY

Automatic Bar Machines and Magazine Bar Feeders

BROWN & WARD (TOOLS) LTD.

Leamore Lane, Walsall.

Telephone Bloxwich 76846



RAPID RE-SET

Face Milling Cutters

Secure

RAPID BLADE RE-SETTING
RAPID RE-SERVICING
REDUCED CUTTER DOWN TIM

The Wickman Rapid Re-set system brings even higher efficiency in production milling. Reservicing of Milling Cutters is quicker and simpler by utilising the off-hand grinding method together with the Special Wickman Rapid Re-set Equipment for Face Milling Cutters.





tyle 2 Cutter for general Sty

Style 3 Cutter for milling cast

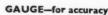
RAPID RE-SET EQUIPMENT

The use of the Wickman Rapid Re-set Cutter
Body and three blade styles available
provides a simple variation of blade geometry.
The blades can be removed, re-ground,
checked and replaced in any Cutter Body size
within the range—WITHOUT REMOVING
THE CUTTER BODY FROM THE MACHINE,
thus reducing down times and costs
to a minimum.

WRITE FOR YOUR COPY OF THE NEW WICKMAN FOLDER
"WICKMAN RAPID RE-SET FACE MILLING CUTTERS"
FOR THE FULL STORY.



GRIND-with special jig







RE-SET-in setting block



WIMET DIVISION, TORRINGTON AVENUE, COVENTRY.



Telephone 66621



MACHINERY is registered as a newspaper at the General Post Office and is published every Wednesday by The Machinery Publishing Co., Ltd. The name is a registered erada mark.

All rights of reproduction and translation are reserved by the publishers by virtue of the Universal Copyright and International Copyright (Brussels and Berne) Conventions and throughout the World.

C The Machinery Publishing Company, Limited, 1961.

LONDON OFFICE

REGISTERED OFFICE, EDITORIAL, SHALL AND CLASSIFIED ADVERTISEMENTS DEPARTMENTS AND ENQUIRY BUREAU CLIFTON HOUSE

83-117 EUSTON ROAD LONDON, N.W.I.

Telephone: Euston 8441/2 Telegrams: Machtool, Norwest, London

HEAD OFFICE

SUBSCRIPTION, ADVERTISEMENT. SERVICE. PHOTOGRAPHIC, ACCOUNTS AND SOOK DEPARTHENTS NATIONAL HOUSE 21 WEST STREET BRIGHTON, I.

Telephone: Brighton 27356 (4 lines)



NEW YORK: 93, Worth Street

PARIS: 15, Rue Bleue

Managing Director: LESLIE R. MASON Editor: CHARLES H. BURDER Chief Associate Editor: P. A. SIDDERS Associate Editors: A. P. LIPSCOMBE, G. W. MASON, S. C. POULSEN, R. E. GREEN, A. W. ASTROP, A. J. BARKER

Editorial Representatives: F. W. HERRIDGE. R. SUTCLIFFE

PRICE PER COPY:-One shilling and three-

SUBSCRIPTIONS:-Inland and SUBSICEIT FIONS:—Inland and oversees, 52 shillings per annum (and pro rata), post free. Cheques and Money Orders should be made payable to the Machinery Publishing Co., Ltd.

Co., Ltd.

ADVERTISEMENTS:—Copy for displayed advertisements, if proofs are required, should reach the Brighton office 21 days in advance of publication. Rates on request.

Small (classified) advertisements can be accepted, space permitting, at the London office up to Wednesday, for publication on the following Wednesday. For rates, see p. 131.

Blocks are held at advertisers' own risk; no responsibility for loss is accepted by the publishers.

MACHINERY

A JOURNAL OF METAL-WORKING PRACTICE & MACHINE TOOLS

Vol. 98, No. 2525

April 5, 1961

PAGE



Editorial

COPIES PRINTED	11,500	per week
CERTIFIED DISTRIBUTION	11,293	per week
CERTIFIED PAID DISTRIBUTION	9,827	per week
Copies sold at full price	9,594	per week
Copies sold at reduced prices	233	per week

CONTENTS

Promotion of Economic Growth			751
Principal Articles (For abstracts see next page	?)		
The Production of the SIMCA Aronde			752
*** 1 C. 1			761
		* *	
			769
Efficient Production System for Dynamo and Start	er-mo	otor	
Housings			777
Ultrasonic Cleaning of Spectacle Frames			790
Gold Star Unit Tooling System			792
Short Articles			
The Electrans Work Transporter Series 80,000 In-line Digital Display Unit			760
Series 80 000 In-line Digital Dignlay Linit			767
			767
Special Milling Machine for Operations on Machine	: .		101
Slides Frauenthal Precision Copy Turning, Boring and			768
Frauenthal Precision Copy Turning, Boring and	Grine	ding	
Machine			782
Machine Mapal Adjustable Hand Reamers			789
			794
Eclipse Magnetic Strip			
Leyland Drilling Machine for Connecting Rod Bolts	5	* *	796
New Production Equipment			
Crossley-Trurnit Pointing and Cold-forming Mad	chines	for	702
Wood Screws			783
Rockford Fully-automatic Shaping Machine			784
Morrisflex-Hammond CFT 40 Semi-automatic Prof	ile Po	lish-	
ing Machine			785
M.A.E. Hydraulic Presses with Broaching Equipme	nt		785
Warner & Swasey Type O-AC Single-spindle			
Automatic			786
Sciaky SP. 0 Bench-mounted Spot Welding Equipm	ant		787
Farrel-Birmingham Heavy-duty Roll Grinding Mac			787
	mne		
New Tornos Single-spindle Automatics			788
Precisa FS 2 Swinging-head Type Bench-mounte	d Sui	face	
Grinder			789
News of the Industry			
Hull and East Yorkshire			795
			798
			801
Scrap Metals Report		* *	
British Machine Tool Imports and Exports (Classif			802
Machine Tool Share Market			804
			-
Classified Advertisements			131
Index to Advertisers			161

Abstracts of Principal Articles

The Production of the SIMCA Aronde P. 752

This article in the series devoted to the production of Aronde cars at the Poissy factory of the French SIMCA organization, is concerned with the building of body shells. Under-body and roof sub-assemblies, and certain other members, are delivered to two stations at opposite sides of a closed-loop trolley-jig line at one end of the main assembly building. The line is rectangular in plan, and similar series of operations are performed along opposite sides, which are connected by turn-table units. At certain stations, supplementary clamping units are moved in on platforms at either side of the trolley track. From this line, body assemblies are passed to the first of two floor-mounted slat conveyors, where final welding operations are performed, also scurfing and buffing. Doors, bonnet and boot lid are assembled at the end of this line, and finally fitted on the adjoining parallel line, whence body shells are delivered to storage conveyors to await despatch to the paint shop. (Machinery, 98-5/4/61.)

Work Study as an Aid to Industrial Efficiency P. 761

Abstracted from a paper delivered before the Work Study Club of the Tyneside Productivity Committee, this article describes a system which has been applied in the author's works to ensure balanced machine loading. The system is based on control of work in abeyance, that is, free for production but standing idle alongside a machine, and is stated to offer a number of important advantages from the standpoints of economics, production, and delivery dates. (MACHINERY, 98—5/4/61.)

Japanese Machine Tool Factories .. P. 769

This article is the seventh in a series on Japanese machine tool builders and their products, and is concerned with the Shibaura Machine Co., Ltd., whose works are located near the border between Tokyo and Yokohama. Some 840 people are employed, and the products include die casting and injection moulding machines, in addition to a variety of heavy machine tools. Much equipment of Western origin is installed in the machine shops, also numerous Japanese machines, many of which were built by the company. A few typical set-ups are illustrated, and reference is made to some of the machine tools in current production, including vertical boring and turning mills with table diameters up to 26 ft. 3 in.,

large lathes, and draw-cut shapers, which are also arranged to perform milling operations. (MACHINERY, 98-5/4/61.)

ac

sp

in

in

be

in

ol

of

ce

01

a

tl

n

h

1

Efficient Production System for Dynamo and Starter-motor Housings . . . P. 777

Housings for dynamos and starter-motors are produced from flat coiled stock by very efficient methods at the Electric Autolite Co., Toledo, Ohio, U.S.A. After passing through straightening rolls, and a squaring unit whereon the end of one coil and the start of the next are sheared and welded together, the material enters press tools, on which various holes are pierced, and is subsequently led to the main bank of Yoder forming rolls. Here the strip is progressively rolled round, to form a cylinder, and the joint is seam welded. Portions of the required length are cut from the cylinder by a flying shear and are passed by chutes to automatic lathes, on which facing and chamfering operations are carried out on each end. Finally, the inner and outer housings are automatically assembled on a Grotnes machine. (MACHINERY, 98—5/4/61.)

Ultrasonic Cleaning of Spectacle Frames P. 790

At the works of the British American Optical Co., Ltd., Watford, surface imperfections on spectacle frames are polished out with the aid of a wax-like compound, which adheres strongly to the plastics. This compound is removed very effectively by a German-built Schoeller ultrasonic cleaning plant, which incorporates twin laminated nickel transducers. The frames, held in wire baskets, are lowered into a tank of hot Grisiron cleaning solution, and the transducers are switched on. Subsequently, the baskets are removed to a separate section of the installation, where a cold water rinse removes the Grisiron solution. It is estimated that the plant, which is tended by a single operator, performs the work of 12 people, who would be required to clean the frames by manual methods. (MACHNERY, 98—5/4/61.)

IN FORTHCOMING ISSUES

Quantity production of poppet valves—Designing ferrous parts for furnace brazing with copper—Drilling printed circuit boards—Protection of electrically-driven machine tools.

Contributions to MACHINERY

If you know of a more efficient way of designing a tool, gauge, fixture, or mechanism, machining or forming a metal component, heat treating, plating or enamelling, handling parts or material, building up an assembly, utilizing supplies, or laying out or organizing a department or a factory, send it to the Editor. Short comments upon published articles and letters on subjects concerning the metal-working industries are particularly welcome. Payment will be made for exclusive contributions.

EDITORIAL

Promotion of Economic Growth

Although there appears to be considerable difference of opinion as to the ways in which it could be achieved, it is probable that there is fairly widespread agreement that a more rapid improvement in the average standard of living is both possible in theory and desirable in practice. It can hardly be disputed, moreover, that any substantial advance in this respect can only be brought about by increasing the rate at which better facilities are made available to the average industrial worker for obtaining higher outputs for the same expenditure of physical or mental effort. Regardless of what could be achieved by greater diligence and better organization, it would be unreasonable to expect any significant or sustained rise in productivity in the absence of a greater degree of mechanization or automation.

also

ERY.

mo

777

pronods

S.A.

d a

the

ious

nain

D is

and

uired

hich

t on

are

nine.

790

Co.,

tacle

-like

stics.

lant,

icers.

into

and, the

n of

s the

olant,

s the

98-

ming

ctric-

8

What is primarily required, then, is to ensure that labour is used more efficiently by providing more highly developed machinery and making more horse-power available for each person employed. The factory owner, however, is principally concerned with the results that he can achieve and if it appears to him to be desirable to continue to use labour in a manner that might elsewhere be regarded as extravagant, rather than embark on an extensive programme of re-equipment, he can hardly be expected to be deterred from this policy because it may not appear to be in the general interest. To some extent, of course, modernization of factory plant may be necessitated by competition, rising wages, or demands for product improvement, but owing to various circumstances it seems that these influences have not been sufficiently impelling in the past to ensure an adequate rate of economic growth.

In a publication* recently issued by Political and Economic Planning, it is pointed out that whereas the United Kingdom still has the highest income per head of any major country, apart from the United States, the rate of economic growth in relation to the population has recently been only about 2 per cent per annum, and has been exceeded in almost all the other European countries. This rate of growth, it is suggested, has lately been restricted by the fact that the movement of labour from less productive to more productive uses is slower here than on the Continent. In seeking an explanation for this state of affairs, the authors of

the publication point out that the Continental practice of placing the major part of the social security cost on the employer, and not on the public exchequer, as in the United Kingdom, tends to encourage economy in the use of labour. At the same time, although comparisons are more difficult, it appears that the burden of capital taxes in Continental countries is decidedly lower than in this country.

"The important factor is the difference in the incidence of taxation in the United Kingdom and on the Continent. In the latter area there is an incentive given by the tax systems to the industrialist to install more new capital equipment and to reflect more clearly the true cost of labour by using it more sparingly and efficiently. The reverse is the case in the United Kingdom, where taxation falls relatively more heavily on capital than on labour, as compared with the Continent."

One method, it is suggested, whereby this situation might be corrected would be to introduce a payroll tax" which would be paid by the employer as a percentage of the wage bill. This tax would be a replacement and not an additional imposition, with the result that the total demands on industry would be the same but the basis of allocation would be different. Clearly, if the desired effect was to be obtained, it would be necessary to substitute the payroll tax for other taxes which "fall more heavily on capital costs than on labour costs." Examples which come under this heading are profits tax and local government rates paid by industry. "Alternatively a change in the depreciation provisions could be used instead of reducing the profits tax, or better still, a reduction in the long-term rate of interest should be possible."

In connection with the present system of rating, it is pointed out that the incidence is much greater on firms with heavy fixed plant and machinery than on those with less capital equipment but more employees. The existing method of collecting rates "could therefore be considered as having a disincentive effect on investment in capital equipment and also as encouraging the use of labour."

If the authors of this publication are correct in their conclusion that the current fiscal policy is having the effect of partially cancelling out thosefactors—such as rising wages—which might be expected to stimulate mechanization in industry, the

⁽Continued on page 800)

^{*} The Promotion of Economic Growth. P.E.P. 16 Queen Anne's Gate, London, S.W.r. Price 3s.

The Production of the SIMCA Aronde



Methods and Equipment for Building
and Finishing Bodies for this
Popular French Car in the
New Works at Poissy

By P. A. SIDDERS, Chief Associate Editor

IN THIS SERIES OF ARTICLES* devoted to the manufacture of Aronde cars at the new Poissy factory of the French SIMCA organization, the production of body components and sub-assemblies has been followed to the stage where the under-bodies and roofs have been completed, and are ready for assembly and spot-welding together. It may be recalled that under-bodies are built on a closedloop trolley-jig line, which passes through five Languepin multi-point spot-welding machines, and are finished on a conveyorized line that is parallel to the long sides of the trolley-jig loop. Roof subassemblies are built at a series of floor stations and a trolley-jig circuit, and are finished on a conveyorized line that is parallel to the finishing line for under-bodies. Sub-assemblies from both finishing lines are unloaded on to special trolleys, whereby they are transported to either of two pick-up positions below overhead travelling hoists. These hoists serve for the transport of the subassemblies, in pairs, to either of two loading stations of a further closed-loop trolley-jig line, known as a "berceau", whereon they are assembled and welded.

Fig. 1 is a plan view of the trolley-jig line, and the end of the finishing line for roof sub-assemblies is indicated at a. The overhead conveyor b carries the under-bodies along the finishing line, and the drop-section for unloading sub-assemblies from the overhead conveyor is indicated at c. Tracks for the overhead travelling hoists for transfer of the under-bodies and roofs to the

trolley-jig loading stations are indicated at d and e, and the track d which serves the loading station nearer to the sub-assembly finishing lines, is at a low level, whereas the track e is at a higher level, to clear the equipment and workers on the trolley-jig loop-line. Moreover, the hoist on the track e moves in a closed circuit, and that on the track e, moves to and fro between the pick-up position and the loading station.

The trolley-jig line is raised about 3 ft. 6 in. above the shop floor, and on either side of the trolley track there are steel-slat platforms. Of rectangular form in plan, the line has two long tracks f and two short tracks, the four being connected by turn-table units, as at g. The line provides for assembling and welding two sets of sub-assemblies simultaneously, and loading is carried out at stations h and j, each at the head of one long track. Work is performed at the three other stations of each long track, and at the single station of the following short track, the operations along opposite sides of the loop being identical.

Turn-table g, and the corresponding unit at the diagonally-opposite corner of the loop line, swing through 90 deg. for movement of trolley jigs from the long tracks to the short tracks. The other two turn-tables, however, can also be set with their tracks at 45 deg. to the side tracks, and in this position the turn-table tracks are in line with a series of supplementary tracks within the main loop line. These tracks comprise short and long sections connected by a manually-operated turn-table unit k, and any trolley jig that develops a fault can be shunted from either main turn-table on to the supplementary track for repair. More-

^{*} MACHINERY, 95/252—19/8/59; 95/676—7/10/59; 96/748—6/4/60; 96/880—20/4/60; 96/1036—11/5/60; 97/820—13/7/60; 97/1104—4/16/11/60; 97/1220—30/11/60; 97/1320—21/21/60; 98/18—4/1/61; 98/236—1/2/61; 98/580—15/3/61 and 98/696—29/3/61.

over, should there be a breakdown of the equipment affecting one pair of tracks, these tracks can be by-passed and the trolley jigs circulated along the other pair of outer tracks and the central tracks.

A stand-by trolley jig is stored on a short length of track in line with the main track f, as indicated at l, and can be moved on to the main track by way of the adjacent turn-table. This short track is in an area that is enclosed by a high chain-link fence, wherein are stored spotting jigs for checking the completed assemblies and the trolley jigs, also a master m for checking the equipment installed along the main tracks. The master is built on a trolley-jig base, and it can be moved on to the short track normally employed for storing the stand-by jig l, by means of an overhead crane.

Thence it can be transferred to the main track of the loop line by way of the turn-table, as seen in Fig. 2. In this illustration, some details of the construction of the turn-table can be observed, and it may be noted that it has rubber-tyred wheels which run on a circular track, mounted on a concrete foundation on the shop floor.

The spotting jigs have frames of welded tubing, for lightness, with fabricated brackets welded at the required positions. These brackets carry gauging plungers and pads, and the spotting jig for checking the trolleys is seen in use in Fig. 3.

A close-up view of a turn-table is given in Fig. 4, and the track whereon the trolley jig moves is indicated at A. Between the pair of rails forming this track there is another pair which supports the carriage B. This carriage is coupled to two

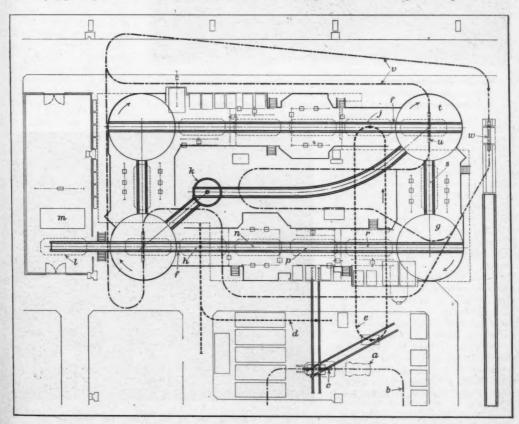


Fig. 1. Diagrammatic layout of the closed-loop trolley-jig line for assembly of under-bodies, roofs, central door pillars, front wing sub-assemblies and side-member fairings. There are two loading and two unloading stations, and similar operations are performed on opposite sides of the loop

oissy

iding

Editor

d and tation at a level, olley-ack e ack d, osition

6 in.
of the
long
coneeprotes of
mg is
ead of
three
single

rations ical.
at the swing s from other with and in e with main

d long turnlops a n-table More-



Fig. 2. The master employed for checking equipment on the closed-loop trolley-jig line for building bodies is here seen being moved on to one or the turn-tables that connect the tracks at adjoining sides of the loop

plate and sections, and has four flanged wheels.

th

to

WORK LOADING

Work supporting and clamping elements are mounted on the trolley and at the frame. corners there are units which incorporate sliding rams. All these units are similar in construction and operation, although the heights of those at the front and rear ends of the trolley jig are different. One of the units is seen at E, and the design and operation of this unit only will be described.

The upper ram of the unit E is indicated at F, and the lower ram at G, and the inner ends of

loops of triple roller chain, as at C, which pass over sprockets at each end of the track, and are supported by rollers between the carriage rails. The chains are connected to a hydraulic cylinder below the turn-table, and by admitting oil to one end of this cylinder or the other, the carriage is moved in either direction along the track on the turn-table. The arrangement is such that after a trolley jig has been moved on to the turn-table, and the latter unit has been indexed, the hydraulic cylinder is energized, at the start of the pext work-cycle, and the carriage thrusts the trolley-jig on to the following track, moving all the trolleys on that track from one station to the next. It will be appreciated that the trolley at the end of the track is moved on to the next turn-table. from which it is thrust by a similar carriage after that turn-table has been indexed.

Fig. 5 is a close-up view of the rear end of a trolley jig at the loading station h, Fig. 1. The trolley frame D is constructed by welding from steel

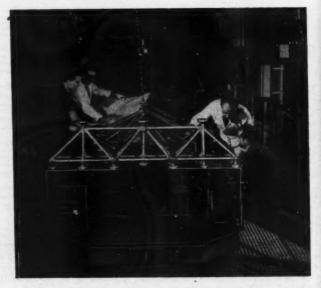


Fig. 3. Checking one of the trolley jigs used on the closed-loop body line. The spotting jig employed is mainly of tubular construction, for lightness, and is stored in an enclosure at one end of the loop-line

these rams are connected to the opposite extremities of a lever, which is pivoted, near its midpoint, on the supporting structure of the unit. A plunger slides horizontally in the unit E, above the ram F, and is coupled to it.

and

els.

and

are

lley

the

inits

slid-

nese

con-

ion.

s of

and

ollev

One

t E,

and

unit

ed.

the

it F,

t G,

s of

At the side of the loading station, in line with the ram F, there is a hydraulic cylinder H, supported on a weldfabricated bracket. shroud J is fitted to the bracket to protect the valves mounted on top of the cylinder, and partially to enclose the piston rod. When an under-body has been loaded on to the seatings of the trolley jig, oil is directed to the outer end of the cylinder, and the piston rod is

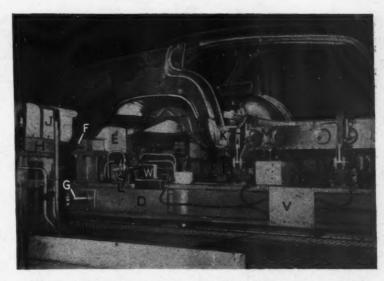


Fig. 5. A view of the rear end of a trolley jig, at one of the loading stations, showing some of the work-clamping and locating units. The roof sub-assembly is here seen resting on the base of the under-body, preparatory to being mounted in the required position



Fig. 4. Close-up view of one of the turn-table units on the closed-loop body line, showing the hydraulically-operated pusher trolley for moving jigs on to the next section of track

advanced, to engage the ram F and thrust it inwards. As a result, the plunger coupled to the ram is moved inwards, and it passes through a hole in the side-member of the under-body, also through a bush in the housing of the unit E, beyond the under-body side member. At the same time, the ram G is moved outwards due to the angular movement of the lever which connects it to the ram F. It will be appreciated that the plungers of the other similar units are also moved inwards, and pass through holes in the front and rear ends of both side members of the under-body. At the end of its travel, the piston rod of the cylinder H is automatically returned.

At each side of the trolley jig, there are three air-operated, self-sustaining clamps, as at K, which engage the side-member of the under-body. All the clamps at one side are controlled by a pedal-operated valve, as at L, and the compressed air supply is connected to the trolley jig at the loading station by means of a quick-release coupling at one end. Each jig serves



Fig. 6. At this station on the bodybuilding loop-line, moving platforms at each side of the track carry supplementary clamping and locating units that engage the front inner wing subassembly, in readiness for welding

for both 2-door and 4-door bodies, and when 2-door bodies are being assembled, the plunger M is depressed by the rear wing, a valve within the housing below the plunger is tripped, and the clamp K is not actuated. Further air-operated, self-sustaining clamps are incorporated in the jig

and secure certain of the other components that are assembled at this stage. In addition to the roof, these components include the front inner wings, the central door pillars (for 4door bodies), and the fairings fitted to the side members of the underbody, below the door openings. In Fig. 5, the roof is seen in its preliminary position, resting on the floor of the under-body, and before the jig leaves the loading station, the roof is placed in its correct position. A team of four operators is employed for loading, and each must hold a palmbutton depressed before the next cycle of the assembly loop line can start. Similar palm-buttons must be actuated by the operators at all other stations of the loop-line.

SPOT WELDING OPERATIONS

From the loading station h, Fig. 1, the trolley jig and work are moved to station n. At this station, there is a platform at each side of the tracklevel with the steel-slat floor-which

can be moved towards and away from the track by

hydraulic power.

These platforms are provided to carry supplementary air-operated, clamping units, also associated support and location members. The trolley jig is raised clear from the track at this station,



Fig. 7. This station, on one of the short sides of the body-building loop line, serves for the welding of front outer wing assemblies, also the fairings on the side members, below the door openings

Fig. 8. An unloading station on one of the turn-tables of the body-building loop line. When the trolley jig reaches this position, all the clamps have been released and the body is free to be lifted clear

and is supported on hydraulic-type rams, mounted below the track, in order to eliminate wear on the rails, due to sideways movement of the trolley wheels, when the supporting and locating members on the platforms engage the work.

alm-

ycle

tart.

ated

tions

d to

is a

hich

k by

ple-

soci-

olley

tion,

ck-

The platforms are moved in after the trolley has been raised, and Fig. 6 is a view of one end of the station, with the platform at one side of the track at its inner setting. A pillar N, at the front edge of the platform, carries a rectangular-section peg, which engages a slot in a block secured to the trolley jig, thus

secured to the trolley jig, thus ensuring correct relative location of the jig and platform. Weld-fabricated brackets, as at P, are fitted with air operated clamps to secure the various components of the body assembly, and a clamp for the front inner wing is seen at R. Other clamp assemblies, as at S, hold the roof in position, while a team of four operators spot-welds the various components to each other and to the underbody.

Spot-welding on the left-hand side of the body is completed at station p, Fig. 1, by two operators, and certain arc welding operations are also carried out at this station. Similar operations are performed on the right-hand side of the body at station r, and at this station, the front outer wing sub-assembly is mounted in position. This sub-assembly is delivered by way of the conveyor e. From station r, the trolley jig is moved on to the turn-table g, and it may be mentioned that there is an automatic safety stop between the rails at the end of the longer straight track, to prevent a trolley jig being advanced on to the turn-table with the rails of the latter out of alignment with the track.

WELDING FRONT OUTER WINGS

As has already been explained, the trolley jig is thrust from the turn-table g to station s, on the shorter straight track, and this station is seen in Fig. 7. Here, again, there are hydraulically-



traversed platforms on either side of the track, and on each platform there is a weld-fabricated support structure, as at T, which carries air-operated clamp units to hold the front outer wing assembly in position while it is being welded. At this station, the fairings for the side members of the under-body are welded in position, and to provide access for this operation, also in readiness for subsequent unloading, the air-operated clamps that engage the side member are released (and with them, those for other components of the assembly). The trolley jig is again supported on hydraulic rams at this station.

One of the clamps for the nearer side member is seen at *U* in the free position, and in this setting it trips a micro-switch at one side of its mounting bracket. All the micro-switches along one side of the trolley jig are connected to a junction box *V*, Fig. 5 and 7, from which a lead is taken to a connection unit *W* (Fig. 5). This unit is engaged by a mating unit *X*, Fig. 7, on the traversing platform, and unless all the clamps at one side of the trolley jig have been released, the power supply to the welding units at that side of the track is not connected.

SIMCA-built spot-welding tools are employed in conjunction with Sciaky transformers, and these units are suspended from a framework, constructed from steel sections, at each station where welding operations are performed.

UNLOADING ARRANGEMENTS

From the station s, Fig. 1, the trolley jig is moved to the turn-table t, where the body assembly is unloaded. The turn-table is seen in Fig. 8, and it is located beneath the drop section u, Fig. 1, of the overhead power-and-tree conveyor v, that serves for the transport of the body assemblies to the body-shell finishing line.

As the trolley jig is moved on to the turntable, it passes between cam plates as seen at Y, Fig. 4 and 8. During this movement, the plates are engaged by the rollers on the ends of the lower rams on either side of the jig at the front and rear ends (one of these rams being indicated at G in Fig. 5). Each ram is thrust inwards, and through the associated lever, withdraws the locating plunger from the side member of the under-body. In consequence, when the trolley jig comes to rest on the turn-table, all the clamps and locating members have been released.

There are special carriers on the conveyor v, Fig. 1, and one of these carriers is seen at Z, Fig. 8, on the drop-section of the conveyor, which is shown fully lowered. The carrier comprises a tubular beam, with a buffer plate at either end, and a cross-bar pivotally mounted at the mid-



Fig. 9. Body sub-assemblies, delivered to this station by overhead conveyor, are fitted with skids before they are removed from the conveyor carrier, and transferred to the first of two slat conveyors that serve the finishing lines



el

at E

Fig. 10. On the second slat-conveyor finishing line for body shells, the gutter above the door opening is finished with the aid of an air hammer, fitted with a special anvil-block

point of its length. At each end of the cross-bar is hinged a swinging arm assembly, which has a counterweight at its upper end, and a transverse member with two rubber-faced claws at its lower end. When the carrier has been lowered on the drop-section, the swinging arm assemblies are positioned one on each side of the body assembly on the turn-table. The arms are then swung inwards, and the claws pass into the door opening to engage the lower and outside edges of the roof. A push-button at a control panel at one side of the loading station is then depressed, and the drop-section is raised, lifting the body assembly from the trolley jig. When the drop-section is again aligned with the main track of the overhead When the drop-section is conveyor, the carrier is released and it is again engaged by the driving chain of the main track. At the start of the next cycle of the berceau, the empty trolley jig is moved from the turn-table t, Fig. 1, to the loading station j, and an empty jig from the diagonally opposite turn-table is moved to the loading station h.

The overhead conveyors from each unloading station join, and body assemblies are carried to the drop section w, at the starting end of the first of two parallel lines that serve for finishing the body shells. This drop section is seen in Fig. 9, and

it is located above a hydraulically-operated elevator A. For its movement along the finishing lines, the body is supported on skids, which are attached to the side-members of the under-body. Each skid comprises a length of steel tube, with brackets at either end, each bracket being fitted with a clamp screw. At either side of the elevator A, there are supports for a pair of skids, and one skid is seen on the elevator at B. Skids are loaded on to the supports when the elevator is in its lowermost setting, and the unit is then raised to position the skids at convenient height for attachment to the body assembly, when the drop section has been lowered. Air-operated drivers are provided to facilitate attachment of the clamping screws of the skids, and one such tool is being used by the operator at the right.

When the skids have been fitted, the elevator is raised to engage the supports with the skids, and the body is released from the carrier on the drop section. The elevator is then lowered, and as it moves downwards, the skids come to rest on parallel sections of roller track, as at C, the elevator frame in its final position being below the rollers. On the roller tracks, the body assembly is moved away from the elevator station until the skids pass on to the slat conveyor that forms the

FINISHING OPERATIONS ON BODY ASSEMBLIES

first finishing line.

ar

rse

he

re

oly

ng

ng

of.

of

oly

ad

ain

ck. he

t,

jig

red

ing

the

of

dy

ind

On the first finishing line, certain arc and oxyacetylene welding operations are performed, and the body assembly is scurfed and buffed with the aid of hand tools. Doors, bonnet and boot lid are assembled, but the hinge fixing screws are not From the end of this line, the fully tightened. body assemblies pass on to a length of roller conveyor, which incorporates a trip switch to stop the slat conveyor if the roller conveyor should be fully loaded. The roller conveyor serves for moving body shells on to a cross-wise transporter, which comprises a trolley with a length of roller conveyor, and runs on rails laid on the shop floor. On this trolley, the body shell is transferred to the head of a second finishing line, parallel to the first. From the transporter, the body shell, still on its skids, is moved on to a length of roller conveyor, and thence on to a slat conveyor, which moves in a direction opposite to that of the first finishing line.

On the second finishing line, the doors, bonnet and boot lid are finally fitted, and the door openings are adjusted, if necessary, with the aid of rack-and-pinion operated jacks. The gutter round the upper part of each door opening is bent roughly to the required section by an operator who uses an ordinary hammer, and it is finished at an adjoining

station. Fig. 10 shows an operator finishing the gutter at one side of a body snell, and a speciallyadapted air hammer is used for this work. The hammer is fitted with a steel anvil block of inverted-U shape, which has a handle that is gripped by the operator's left hand. One leg of the U-form, remote from the hammer body, is shaped to correspond to the required gutter profile, and is engaged with the roughly-formed gutter. It is held in the gutter by a spring-loaded claw, that is pivoted on the other leg of the U-shaped block, and contacts the under-side of the gutter. Starting at one end, the operator slides the anvil block along the gutter, at the same time causing the air hammer to deliver a series of rapid blows to the outside of the gutter, so that it is formed to the required section and planished against the profiled end of the anvil block.

At a later station on the second finishing line, a series of holes is drilled along each side of the body shell for the attachment of a trimming motif. Different motifs are employed for 2-door and 4-door cars, and since the motif extends along the rear wings, the doors and the front wings, the attachment holes are drilled after the doors have



Fig. 11. Holes for the subsequent attachment of trimming motifs are drilled in the body shells with the aid of jig plates that are suspended from overhead tracks. Drilling is performed with pneumatic hand tools, fitted with locator sleeves to engage the jig bushes

been fitted, to ensure correct alignment of the various motif sections.

The drilling station is seen in Fig. 11, and the holes are positioned by means of long jig plates, as at D. Different jigs are used for 2-door and 4-door bodies, and are painted in contrasting colours for identification purposes. There are two jig plates—one of each type—at each side of the conveyor, and each plate is suspended from two self-coiling reels, that are free to move along an overhead track. The jig plate required is pulled downwards by the drilling operators—two at each side of the conveyor—and claws, as at E, along the length of each plate, are engaged with the wings and doors. Spring-loaded hooks, at either end of the jig plate, are then latched under the openings for the front and rear wheels, one hook being just visible at F.

Drilling is performed with Desoutter pneumatic hand tools, and each is fitted with a sliding sleeve, which is urged forwards by a spring to shroud the drill. This sleeve facilitates location of the drill, and reduces drill breakage, since the operator first engages the end of the sleeve with the head of a bush in the jig plate, and then thrusts the tool forwards, against spring pressure, so that the drill slides through the sleeve, enters the bush and passes through it into the work.

On reaching the end of the second finishing line (near the berceau described in the earlier part of this article), each body shell passes from the slat conveyor on to a length of roller conveyor, and

thence to a cross-wise transporter, similar to those already considered, that serves six parallel storage conveyors. These conveyors are of slat-type, but have lengths of roller conveyor at each end to facilitate delivery and discharge of the body shells. Of these conveyors, two serve for storing 4-door bodies that are to be painted in two colours, two for 2-door bodies that are to be painted in two colours, and two for bodies of either type that are to be painted in only one colour. Body shells are identified by the pattern of trim attachment holes along their sides, and drive to the storage slat conveyors is engaged and disengaged, remotely, from the central control station at one side of the paint shop.

At the discharge end of the storage conveyors, there is a cross-wise transporter whereby body shells from any of the conveyors can be moved to a position beneath the drop-section of an overhead power-and-free conveyor that delivers the shells to the paint shop. When the body shell has been attached to a carrier on this conveyor, the skids are removed, and returned to the elevator station at the head of the first body finishing line for fitting to incoming body shells.

The painting department is located on an upper floor at one side of the main assembly building, and is one of the most modern in Europe. Layout of the department, and the methods and equipment employed will form the subject of a further article in the SIMCA series, to be published shortly in MACHINERY.

The Electrans Work Transporter

Originally developed for use in the boot and shoe industry, the Electrans work transporter system, it is claimed, has many applications in other fields where light and medium assembly is involved, and is being marketed for such purposes by Earltram, Ltd., 80 New Bond Street, London, W.1. An installation incorporates a motorized conveyor belt, which can be arranged to serve any number of working stations situated on both sides. Work is despatched to the operators, in containers, from a feed point, by way of the upper run of the belt. After completion it is returned to the same point, once again in a container, but by way of the lower run of the belt.

Each operator is provided with two containers, which are placed on a special stand. As soon as the work in one container has been completed, the container is placed on the lower run of the belt. The second container is then transferred to the working position, and this action transmits a signal to illuminate a light on a control console. In this

way, the despatcher is notified that more work is required.

When a fresh container is placed on the upper run of the belt for delivery to the operator, a pushbutton is pressed to start the belt. A light at the working station is thus caused to flash, to indicate to the operator that the container is on its way. When the container reaches its destination it is placed in the "reserve" position on the stand, and all signals are thus cancelled. In the meantime, the container with completed work has been returned to the feed point where it is automatically discharged.

The electrical system has been specially designed by Earltram, Ltd., and it is stated that the arrangement is such that the work always arrives at its destination, even if delayed by belt slip or accidental obstruction. For safety and ease of maintenance, the control circuits operate on 12-volt

If required, provision can be made for changes in working level, and varying distances between work stations can readily be accommodated.

Work Study as an Aid to Industrial Efficiency

By R. W. MANN+, O.B.E., M.I.E.E., M.I.Prod.E.

Industrial. Efficiency, for the purposes of this article, is defined as the ability of an industry, or of a particular factory, to produce a profit, and the greater this profit the higher is the industrial efficiency. Also for the purposes of this article, it is suggested that industries can be divided into four main groups, of which the first may include the large organization—engaged in the quantity-production of a range of goods—and the smaller unit which produces a single item, again in large quantities. Firms within this category are usually well served by work study procedures.

ose

to ells.

wo

are are oles

on-

om

int

ors,

ody

o a

ead

to

een

are

to

per

ind

of

ent

cle

in

is

per

sh-

the

ate

ay.

is

ind

ne,

en

lly

ed

ge-

its

ci-

of

olt

in

ork

At the other end of the scale there is the very small firm, often owner-operated, which is producing one specific item, for example, and for which the overheads are practically negligible. Almost invariably, such companies can obtain the required profit margin without the need for work study in the accepted sense of the term. Thirdly, there are firms with 2,000 or more employees, producing ranges of goods by a variety of methods, which, by a combination of work study and perhaps exceptional profit margins on a limited variety of semi-competitive goods, obtain sufficient profit to ensure a reasonable degree of industrial efficiency.

It is the experience of the author that firms in the last-mentioned group rarely achieve a degree of industrial efficiency which can compare with that obtained in the fourth, smaller scale, section of industry. In this group can be found medium-size organizations, with between 300 and 1,000 employees, and such companies are responsible for a large share of the country's output. It is in these companies that work study can be most fruitfully applied, and is most likely to raise the standard of industrial efficiency.

INDUSTRIAL EFFICIENCY AND THE MEDIUM-SIZE COMPANY

It is reasonable to assume that by the time a company has expanded to the stage where it requires a labour force of approximately 300, its

products are in good demand and are being manufactured by accepted methods. It follows, therefore, that any substantial increase in industrial efficiency must be sought in other directions. One obvious, and very profitable objective, is to ensure that all employees are working at maximum efficiency, and that all machine tools are continuously and usefully employed. By these means, the direct costs of products can be reduced, higher bonus rates can be achieved (which, in turn, will increase the outputs of those concerned), and levels of work in progress and in store can be reduced, with consequent indirect increase in profit.

To enable maximum industrial efficiency to be achieved, the sales organization of any company must provide a steady flow of orders. In turn, the sales staff is entitled to receive from the factory a steady supply of goods of the required quality and performance. Moreover, delivery promises must be honoured. It is probably the experience of all engaged in production engineering that there is more trouble on the shop floor when conditions are slack than when they are brisk. In theory, there is ample work on the shop floor if, at any machine, the next job is available say 5 min. before the current workpiece is completed. In practice, however, such a condition is not always satisfactory.

In Fig. 1 are shown curves relating to a single production location (in this instance a milling machine), and the solid line denotes the total volume of work waiting to be started at any one time. (A production location is defined as a machine tool, an assembly station, or any other position or item of equipment at which a stage [or stages] of work in a production sequence is performed. Such a location has a measurable output of work, and has facilities for storing work.)

The single dotted line in Fig. 1 indicates the work which is in abeyance at any one time, that is, work which is held up at preceding locations or is not available for production for any reason. It follows that the gap between the solid and the single dotted lines represents the volume of work which is freed for production, or, in other words, the amount of work on the floor alongside the loca-

Abstracted from an article published in the December 1960 issue of Victor Magazine, the house journal of Victor Products (Wallsend), Ltd., † Managing director, Victor Products (Wallsend), Ltd., Wallsend-on-Tyne.

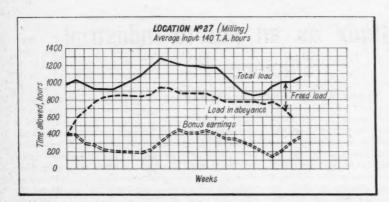


Fig. 1. Graph for one production location (a milling machine) showing the total load on the machine, the load in abeyance, and the bonus earnings

tion, which the operator can observe as work to be done. It will be noted that when the volume of available work falls below that required to ensure one week's activity, then the output of the production location also falls, as do the bonus earnings, which are indicated by the double dotted line.

From these curves it is apparent that whereas bonus earnings are important to an operator, the possibility of working himself out of a job is obviously more important. In this connection it should be mentioned that the drop in production which results from a decrease in the volume of work "waiting" is probably a sub-conscious rather than a premeditated effect. There is a variety of ways in which an operator may become aware of a shortage of work, including an incautious word from a foreman, or a decrease in the number of parts in the work waiting store.

Regardless of how the information is obtained, the operator inevitably knows when the supply of work is decreasing, and the effects are apparent not only at any single production location, but throughout the entire factory. The author has statistics which show that output per man-hour of a complete factory falls in almost direct proportion

to a recession in sales.

In general, it is important that all production locations should be provided with not less than one week's work. It is probable that every works manager is aware of this need, but there are various methods of ensuring such a condition, and some are less satisfactory than others.

The easiest, and most common, solution is to allow work to accumulate at each production location until there is an assurance of continuous employment, and from this point it will be found that maximum output per man-hour will be ensured. In the long term, however, the results of such a procedure are not satisfactory, for a number of reasons, including the following.

(1) Delivery times are automatically extended, and the situation in this respect is adversely affected when managerial pressure is applied to obtain special deliveries, to meet unusual requirements. In these circumstances, delivery times may vary by as much as 500 per cent, and the sales organiza-

tion will be placed in a very difficult position. (2) The volume of work in progress may rise by as much as 300 per cent., with consequent inefficient use of capital and space.

(3) A recession in trade can cause a disproportionate unbalance of machine loading, with the result that there may be a rapid increase in standing time for employees who are not redundant.

(4) There is an overall increase in internal paper work, correspondence with customers, and in the work of progress and contact staff, and the illwill which is almost inevitably generated is a very important, if immeasurable, factor affecting industrial efficiency.

It may be helpful to set out the requirements for ideal production conditions, as follows.

(a) Every production location must be continuously loaded with not less than a week's work, and there must not be more than the required amount of potential work in train.

(b) There must be some means of determining rapidly when the conditions set out in (a) are not being fulfilled.

(c) Every operation within the organization must be carried out in the correct sequence, and at the correct time, to ensure, as far as possible, maintenance of delivery dates. It is assumed that all orders are numbered in some way, to provide for correct sequence of manufacture.

(d) Conditions must be such that all operators will continuously earn maximum bonus, that is, will produce work at their maximum rates.

It is considered that the requirements set out under (a) to (d) above can only be met by the scientific application of work study, and it is proposed to discuss a representative example.

WORK STUDY APPLIED TO MACHINE LOADING

put

be

ong

re-

ure

for

in-

are

led,

this

sely

ma-

lied

de-

sual

nese

ery

as

ent,

iza-

ion.

by

in-

por-

the

ind-

per

the

ill-

ery

dus-

ents

inu-

and

ount

ning

not

nust

the

ain-

all

for

tors

will

out

the

pro-

It is assumed that in any factory where the problems of edicient manufacture are being studied seriously there already exist certain systematic methods of production and costing by means of which the following essential information can be obtained:—

 The number of operations required for any particular workpiece, and the machines on which the operations are to be performed.

(2) The time allowed for each operation, and the net time actually taken to produce any particular workpiece.

It is also assumed that the system provides that all orders from customers to works, and from stores to works for stock requirements, will ultimately result in job cards being made out to indicate the work to be done, the time allowed for such work and the location or locations at which the work is to be carried out.

If, for example, there are 40 machine locations then there is no difficulty in crediting each location with time-allowed hours in respect of each operation, with the result that at the end of each week it can be shown that each location has received a certain amount of incoming work, expressed in terms of time-allowed hours. Consequently, over a period an average can be calculated which will indicate the incoming weekly work load to each location, and therefore the required output. Furthermore, as each operation is completed, the location in question can be credited with the necessary time-allowed hours.

Provided that, when starting to collect data, allowance is made for work in progress, and in

abeyance at each location (in terms of timeallowed hours), it is then possible to determine the following, weekly:—

(1) Total input to the factory.

(2) Total output from the factory.

(3) Total input to each machine location.

(4) Total output from each machine location.

(5) Balance of work at each machine location.

If the total time allowed for each location is divided by the total time expended (as provided by the costing department) the bonus ratio for each location will be obtained, and sufficient information is then available for a preliminary work study to be carried out.

On the basis that the required output from any given production location must match the input, it is now possible to calculate what is required from an operator and a machine, as the following example shows.

Input/output required = 1,000 time-allowed hours/week Bonus ratio allowed = 2.5

Time expended per week to produce required 1000

output =
$$\frac{1000}{2.5}$$
 = 400 hours.
Men required per 42-hour week = $\frac{400}{42}$

Men required on maximum overtime week of 50% hours = $\frac{400}{50\%}$ = 8 men,

It follows, therefore, that for this particular location, the required output can be obtained by employing 10 men, without overtime working, or, more efficiently, 9 men with a certain amount of overtime working. The management knows, however, that the required output can be obtained, in an emergency, by 8 men, if consistent overtime is worked.

Simple calculations of the kind set out above will often reveal striking discrepancies between what is being done in practice and what is actually required, and the correction of such discrepancies is the first step towards increasing industrial efficiency. The information set out above can

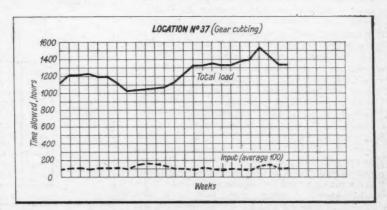


Fig. 2. This graph, for a gear cutting machine, shows a consistently heavy total load in relation to input

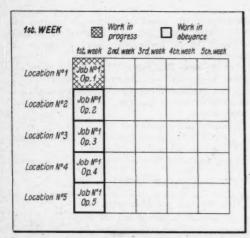


Fig. 3. Machine loading chart for a hypothetical job involving five operations, each performed on a separate machine, and each requiring one week's work for completion

be expressed in graphical form, as shown in Fig. 2, which presents curves of input and total load for a gear cutting machine. The input, expressed in time-allowed hours, is represented by a dotted line, and it will be seen that the average per week is 100 hours. Shown as a solid line, the total load curve reveals that at one point the work in hand at this location represented 15 weeks' production.

The question must now be asked-how much load should be provided at each production loca-Should the load represent an hour's, a week's, or a month's work, or more? It may be noted that there is a theoretical ideal load for any production location. If this load is exceeded, then the location will be overloaded and delivery times will be increased in consequence, and if less than the ideal load is maintained then ultimately there will be idle time. If at any given location there is certain work to be performed-which, for example, might be the 17th operation in a sequence -then the load for that location remains in abeyance for the time required to complete operations 1 to 16. If the location in question was solely concerned with performing operation 17, then there would always be work in abeyance equivalent to the time required to complete operations 1 to 16.

In practice, however, there may be a large number of different jobs for any one location, and these jobs may require times ranging from a few seconds to several hours. Moreover, the work-

pieces may be required in widely different quantities, for example in batches ranging from 50 to 5,000. As a result, the possible combinations of these factors will be extremely numerous, and even with the assistance of a computer it may not be possible to determine what the loading for any particular production location should be. It is necessary, therefore, to investigate whether any useful pattern can be discerned in the complex situation which is thus presented.

HYPOTHETICAL CASE HISTORY

The situation can perhaps be best explained by means of a simple and hypothetical example. It is assumed that a factory is concerned with making one article only, that this article requires five different operations, and that the latter are carried out at five separate machines or production locations. Also, for simplicity, it is assumed that the time required for each operation is one week.

The simple chart in Fig. 3 has five vertical columns representing five complete weeks, and these columns are divided horizontally to represent the five operations required to complete the article. The position at the end of the first week is shown in Fig. 3, where the cross-hatched square indicates that operation 1 has been completed on the first article. At the end of the second week, the position is as shown in Fig. 4, that is, operation 2 has been completed on the first article, and operation 1 has been completed on the second article. It will be noted that in Fig. 3 no machine has any work in abeyance, but that at the end of the second week

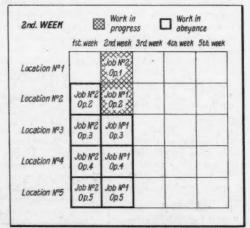
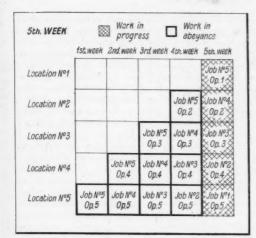


Fig. 4. The chart in Fig. 3 has here been brought up to date at the end of the second week



nti-

to

of

ven

be

any

is

anv

lex

by

It is

ing

five

ried oca-

the

ical

and

sent

icle.

own

ates

first

osi-

has

on 1

will

k in

veek

Fig. 5. At the end of the fifth week, the weeks of work in abeyance for each location can be seen to be one less than the operation No. that is being performed at that location

(Fig. 4) machine No. 2 (for operation 2) has work for one week in abeyance, namely that being carried out on machine No. 1 (operation 1).

The position at the end of the fifth week is shown in Fig. 5, where it will be seen that with the exception of location 1 all machines have work in abeyance. Location No. 5 has work for four weeks in abeyance, location No. 4, work for three weeks, and so on. It can be established therefore that the *unavoidable* abeyance figure is always one

less than the number of the operation that is being performed at any given location.

Where several different workpieces are being handled, the operation numbers of the operations to be performed at a given location will vary at random, but for each particular piece the amount of work in abevance at that location will be determined by the operation No. (performed at that location) minus one. It will be found, moreover an average in factory, with a more or less uniform pattern of production, the average figure obtained by adding together the operation numbers of the operations performed at the particular location, and dividing the result by the number of different workpieces involved, will vary little as between different periods. The average operation number thus determined may therefore be used to estimate the amount of work in abeyance. For example, if this average number is 7 then the unavoidable abeyance load is 6 weeks' work.

As mentioned earlier, however, the average input/output required for any location is already known, and for purposes of explanation may be assumed to be 100 time-allowed hours. It follows, then, that the unavoidable abeyance load for a location at which the operation No. average is 7, is $6 \times 100 = 600$ time-allowed hours.

Account must be taken, of course, of the fact that demand (incoming orders) will vary from week to week. It is obviously impractical to attempt to vary output week by week in order to match demand. The required output must therefore be based on an average demand, and the ideal output, with a plus and minus variation of, say, 20 per cent, can be calculated for each individual location, or a common figure can be adopted to cover all locations.

In Fig. 6, the curves shown in Fig. 2 have been reproduced, and a mean abeyance load line (600 time-allowed hours), also upper and lower limit lines of 720 and 480 time-allowed hours, have been added. The work in abeyance should ideally not be allowed to rise above, or fall below, the upper and lower limits, and it is necessary therefore to establish a method by which the actual value of work in abeyance can be calculated.

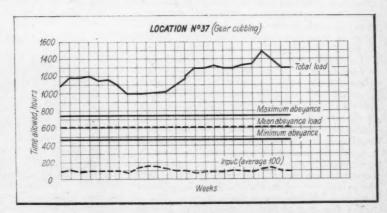


Fig. 6. The graph in Fig. 2 has here been modified by the addition of mean, minimum and maximum "work in abeyance" lines

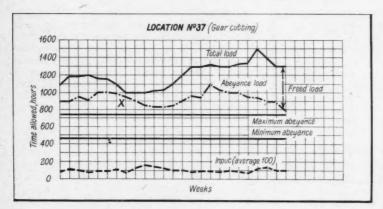


Fig. 7. Further modification of the graph seen in Fig. 6, showing the actual value of work in abeyance and the "freed load"

One obvious method would be to obtain a weekly summation of all job cards, but this procedure would be extremely laborious, and a simpler alternative is available. After the requisite timeallowed hours have been allocated to the first production location, and assuming that all the necessary work material is available, operation 1 can be considered "freed" for production, and the number of time-allowed hours can be regarded as "freed load". Time-allowed hours for all other operations on the job are then transferred as "abeyance loads" to their respective locations. As operation 1 is completed, the number of timeallowed hours for operation 2 becomes "freed load," with the result that the total of work in abeyance is reduced, and this procedure continues until the job is completed. With such an arrangement, all work in the factory can be expressed in terms of time-allowed hours, and can be classified as Total Load, Freed Load, and Abeyance Load.

The graph in Fig. 6 can now be modified again, as seen in Fig. 7, by the addition of another curve (chain-dotted) which represents the actual abeyance load, week by week. It will be noted that at all times the abeyance load was in excess of the maximum allowed, but that at one point, indicated at X, there was less than one week of freed load for the location. Under ideal conditions, the abeyance load would not rise above the maximum abeyance line, and at no time would there be freed load of more than one week. Over the period covered by the graph these conditions were not fulfilled at any time.

The first step towards correcting the situation would undoubtedly be to institute maximum overtime working, or to transfer work to other locations, in order to reduce the freed load from approximately five weeks one week. position shown in Fig. 7 is no doubt ideal from the standpoint of the shop floor, since there is an obviously large amount of work waiting, but the extent of the freed load at this location is in effect causing a delivery delay of four weeks, on all jobs involved. If similar delays are being caused by excessive freed loads for other locations, the overall effects can be very serious.

For rapid determination of total load, freed load, and abeyance load, in terms of time-allowed. hours, the modern procedure, now almost essential for a large factory, is to programme a computer, which will make all the necessary calculations, from information supplied in the form of punched tape. From the author's own experience of recording data relevant to about 200 producers, the time involved is about 3 hours per day for two operators, and the computer is employed for approximately 1 hour per week. Alternatively, the work can be performed by an experienced comptometer operator, who would be occupied approximately full time. With either method, data in respect of a full week's work ending on a Friday can be in the hands of the management by the following Monday.

CONCLUSION

The system of works load analysis described in this article was first applied to the author's works approximately 12 months ago, at a time when it was believed that the factory was in advance of many others from the standpoint of industrial efficiency. It was found that the introduction of the procedure outlined led to a simplification of much of the company's system. In particular, it permitted a change from standard cost control of the individual job to control of machine location, which led to a considerable saving in paper work and staff. The analysis of graphs for the various machine locations revealed unexpected—often considerable—unbalanced loading of machines and operators.

Perhaps the most important advantage that has

been gained from the ability to balance machine loading throughout the factory has been the reduction in the value of stock and work in progress, which, incidentally, has made extra space available. Of some 40 machine locations investigated, it was found that one only was loaded in accordance with the theories outlined in this article, and that many were overloaded by as much as 300 per cent. In the process of correction, some 8 per cent of the employees were found to be redundant, but for most of them other occupation was found within the works.

The "balancing" process is still continuing, but is now rapidly approaching completion. It may be of interest to give a summary of a year's work under the new system, in comparison with the

results for the previous year.

ie

m

ie

ge

g,

a-

ır

n-

ys

xor

r-

ry

ed

ed .

al er,

ed of

rs,

or

ed

ed

d,

a

nt

in

ks

it

of

ial

of

of

it

of

on.

ork

ous

en

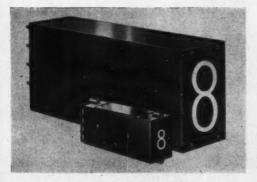
nd

nas

Invoiced turn-over, up 17½ per cent; gross profit on turn-over, up 3¾ per cent; stock levels, down 18½ per cent; work in progress, down 7½ per cent; number of producers, up 3 per cent; average weekly wage of producers (including overtime) up 21 per cent; idle time, waiting for work, down 43 per cent; setting time, down 18 per cent; number of orders overdue to customers, down 32½ per cent.

Series 80,000 In-line Digital Display Unit

Counting Instruments, Ltd., 5 Elstree Way, Boreham Wood, Herts., are marketing the Series 80,000 in-line digital display unit, here illustrated, for use in supervisory control panels, display boards, testing equipment, and process control installations. It displays a character 3% in. high by 2 in. wide.



Series 80,000 in-line digital display unit made by Counting Instruments, Ltd.

In this unit, a single number may occupy the entire viewing screen, or a combination of different words and figures may be displayed simultaneously. When a single letter or digit is displayed it can be viewed from a distance of more than 100 ft. All numbers and characters are rear projected on to the screen, and are of uniform size and intensity.

Sinex Rotary Electric Vibrators

The Sinex Engineering Co., Ltd., Central Way, North Feltham Trading Estates, Feltham, Middlesex, have modified the mounting arrangements for their range of rotary electric vibrators.



Sinex rotary electric vibrators are now standardized with a lug mounting arrangement. Adapters are available to permit interchangeability with earlier types of vibrators with different mountings

Previously, these vibrators were supplied with lug, plate, and pin mountings, but to enable production to be standardized, lug mounting bodies only will be made in future, as shown in the accompanying illustration. Three types of adapter, namely channel, plate and pin, will, however, be available, to permit the new vibrators to be interchanged with the former types. One advantage of the new arrangement, where a pin fixing is employed, is that it is no longer necessary to replace the body, but only the adapter, if wear or breakage occurs at the pin hole.

Four types of vibrator are available, designated SVA/2, SVB/2, SVC/2 and SVD/2 with centrifugal force ratings from 0 to 300, up to 0 to

8,000 lb.

Special Milling Machine for Operations on Machine Tool Slides

In the accompanying Fig. 1 and 2 are shown close-up front and rear views of a special Milwaukee milling machine installed in the works of the Gisholt Machine Co., Madison, Wis., U.S.A., for operations on the under-surfaces of machine tool slide members. As will be seen from Fig. 1, there are two heads on the front of the cross-rail, each of which is arranged for vertical feed of the spindle to enable drilling, boring or slot milling operations to be carried out, in addition to face or edge milling. The right-hand head can be traversed on the cross-rail, in synchronism with the table movement, and with this arrangement surfaces can be milled at one pass which are inclined at an angle to one another.

Transverse movement is derived from a rack on the edge of the table which meshes with a pinion on the end of a shaft in the housing A. From the shaft, drive is transmitted to the screw on the cross-

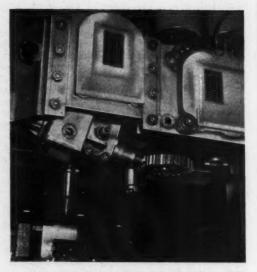


Fig. 2. This view shows the two heads on the rear of the cross-rail of the special Milwaukee machine. The inclined spindle head on the left has independent vertical adjustment and provides for milling an undercut form on the work

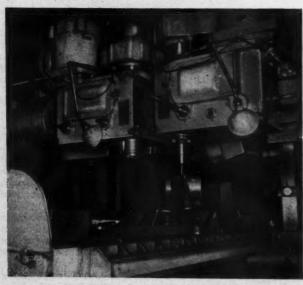


Fig. 1. A close-up view of the front heads of a special Milwaukee milling machine for operations on the guiding surfaces of machine tool slides

rail through change gears which provide for varying the angle of taper.

TH

M

Sh

of

Lt

en

m

tri

m

to

Two additional heads are mounted at the rear of the cross-rail, as seen in Fig. 2, and the head on the left, which has independent vertical adjustment, carries a spindle inclined at an angle to the horizontal for machining an undercut form on the workpiece. The 2-spindle head on the right can be equipped with two large diameter face milling cutters for machining a wide flat surface.

With this arrangement of cutters, the under-surface of the cross feeding hexagon turret saddle for a Gisholt lathe can be machined at one pass, including the taper on the gib surface. The work is set at the required taper angle on the table of the machine, and the head at the front mills an edge parallel to the longitudinal axis. A dial indicator, mounted on a holder which can be clamped to the column guideway, facilitates accurate repeat setting of the crossrail for height.



Japanese Machine Tool Factories*-7

Shibaura Machine Co., Ltd., Yokohama

By R. E. GREEN, Associate Editor

THE BUSINESS which is now known as the Shibaura Machine Co., Ltd., was founded under the name of Shibaura Machine Tool Co., Ltd., in 1938, as an off-shoot of the Tokyo Shibaura Electric Co., Ltd. From its earliest days, the company was engaged in designing and building various types of machine tools of large size and high accuracy, most of which had not previously been made in Japan, and the capital and assets were gradually built up. In 1945, the present title was adopted, and after the war the activities of the company were expanded to include the production of industrial machinery including pulping and papermaking machines, and printing presses, in addition to machine tools.

In 1949, each of the four factories owned by the organization was made independent. The company which retained the original title was left in possession of an extensive factory, built on reclaimed land on the southern shore of Tokyo Bay, at 4, 2-chome, Suehiro-cho, Tsurumi-ku, Since that time, the production of large machine tools, pulp and paper-making machines, and printing presses has continued. In 1955, the design and construction of pressure die casting and injection moulding machines was begun. Rapid progress was made, and in 1959 some 45 machines of this type were made, and the company thus became one of the two largest builders of such machines in Japan.

The Tsurumi district is one of the most important manufacturing areas in the country, and has a plentiful supply of skilled labour which is drawn from nearby Yokohama and Tokyo. Some 840 people are employed by the company, of whom the male design and administrative staff account for about 280, and workers on the shop floor for In addition, approximately 90 women are engaged mainly in office work. At the time of our visit, the yearly value of the company's

*Articles on the Japanese metal-working industries which have already been published in Machineray have been concerned with the 4th Osaka International Trade Fair, 96/1212—1/6/60 and 96/1288—8/6/60; Motor Car Production in Japan, 96/1242—1/5/60, 96/1352—2/6/60 and 96/1640—29/6/60; Bicycle Production in Japan, 97/46—6/7/60; Refrigerator Production in Japan, 97/46—9/3/60, 98/176—25/1/61, and 98/640—29/3/61; Electric Motor Production in Japan, 97/98—38/9/60, 98/176—7/12/60 and 97/1448—28/12/60; Television Receiver Production in Japan, 97/932—36/10/60; Television Receiver Production in Japan, 97/932—36/10/60; The Machine Tool Industry of Japan, 97/108—13/760; Japanese Machine Tool Factories, 1. Regai Iron Works, Ltd., 97/304—10/8/60; Co. Okuma Machinery Works, Ltd., 97/472—71/6/60, 3. Toyoda Machine Works, Ltd., 97/622—21/9/60, 4. The Kawasaki Works of Hitachi, Ltd., 97/1048—9/17/60, 5. Mitsui Precision Machinery & Engineering Co., Ltd., 98/408—22/2/61, 6. Hitachi Machinery Co., Ltd., 98/608—15/3/61.

roted een eft,

adat inrkthe rge for

ing nolt ass. surred the

ers.

ont ngited l to

ates OSS-



Fig. 1. Installed in the gear production section, this Maag machine is one of several employed for finish grinding hardened gears for Shibaura machine tools

products amounted to about £1,370,000, including approximately £1,000,000 for machine tools, and £300,000 for die casting and injection moulding machines.

The land occupied by the company at Tsurumi has an area of about 256,000 sq. ft., and the factory buildings have a total floor area of 231,600 sq. ft. The buildings are of modern, steel-framed design, with sufficient roof clearance and crane

capacity for handling the large castings required for heavy machine tools and other equipment produced. In the shops, most of the machine tools are grouped according to type, and finished components are transferred to large erecting bays or stores, as required. The precision measuring equipment is

re m in

0

m of F

ca

is wind cou a thing special section is section in the section in the section is section in the section in the section is section in the section in the section in the section is section in the section i

housed in a humidity- and temperature-controlled room, which no one is allowed to enter without removing his shoes in a vestibule and donning standard plastics slippers.

Equipment installed for the production of gears includes a Parkinson gear shaper made in 1939, also Fellows (Alfred Herbert, Ltd.) gear shapers, and hobbing machines by Gould & Eberhardt (Drummond-Asquith, Ltd.) and Reinecker (Stuart

Davis, Ltd.). Gear grinding machines by Niles (Elgar Machine Tool Co., Ltd.), and Maag (Burton, Griffiths & Co., Ltd.) are also provided, and a view of one of the Maag machines is given in Fig. 1, set up for finishing a lathe gear.



Fig. 2. For machining operations on various castings required in small numbers, and on some parts of which only one may be required, this Lindner jig boring machine is employed

Fig. 3. Among several planers installed in the heavy machine shop, is this Gray machine, which is seen in operation on the moving platen for a pressure die casting machine of 500 tons locking force



Many parts which are required only in small numbers, such as castings or other parts for machines which are built one at a time, are machined on jig borers, one of which is seen in Fig. 2. This Lindner (Stedall Machine Tool Co.) machine, installed

in the open shop, is boring a series of holes in a casting which will form part of a transfer machine, and is regularly employed for such work.

Among planers installed in the works, the latest is the Gray (Gaston E. Marbaix, Ltd.) machine which is shown in operation in Fig. 3 on a cast iron moving platen for the 500-ton size of pressure die casting machine from the range made by the company. This planer has a capacity for parts

up to 16 ft. long by about 5 ft. square, and the table is driven by a motor of 100 h.p. at speeds from 30 to 220 ft. per min. Some indication of the size and construction of the factory buildings is afforded by

Fig. 3, and it may be noted that each shop has a raised concrete walk-way extending for the full length, from which an elevated view can be obtained. Such an arrangement is common in Japanese factories, and enables both visitors and management staff to inspect the shop floor with ease.

Another planer installed in the large machine shop is seen in Fig. 4, and is the second largest



Fig. 4. An example from the range of planers made by the Shibaura Machine Co., this large machine has a 26-ft. long table and is seen set up for grooving a test roll prior to turning operations on a large lathe

g the uired tools ment hops, chine ecord-ished trans-

s recision ent is rolled ithout nning

ecting

gears 1939, apers, chardt Stuart Gears s by achine and riffiths also ew of

I a a g n Fig. ning a

in

on

nly ed, ing



Fig. 5. Horizontal borers include a Giddings & Lewis machine, here seen in operation boring the injection plunger hole in the fixed platen for a die casting machine of 800 tons capacity

of a range of four sizes built by the company, with a capacity for castings up to 9.8 by 8.5 by 26 ft. This machine is normally used for operations on long machine bed components or tables, but is here set up for cutting longitudinal grooves in a roll which is to be used for test purposes on a large roll-turning lathe of the type seen in the heading illustration. The

roll shown on the planer is of about 3 ft. diameter, and the portion in which the grooves are being cut is 12 ft. long. Each groove is 0.078 in. wide by 0.787 in. deep, and they provide for gripping the billet during the early stages of rolling.

The planing machine is driven by a 75/100-h.p., d.c. motor, at steplessly-variable speeds from 19.6 to 148 ft. per min., through rack and pinion. Representative of the extensive range made by the company, the roll-turn-

ing lathe in the heading illustration has a centre height of 31.5 in. above the bed-ways, and will accommodate work-pieces up to 24 ft. 6 in. long between centres. These machines have hydraulically - operated geared headstocks, and on a typical lathe, 16 spindle speeds, from

0.8 to 25 r.p.m., and 12 feed rates, from 0.0094 to 0.220 in. per rev., are provided. Hydraulic copyturning equipment can be fitted, if required, for profiling operations on rolls.

Several large horizontal borers, of Japanese and Western makes, are installed in the works, and one of the largest is the Giddings & Lewis (Rockwell Machine Tool Co., Ltd.) machine shown in

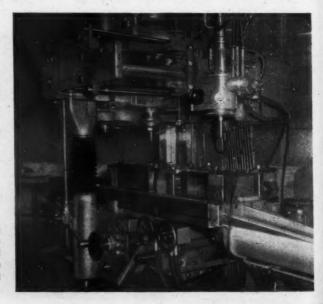


Fig. 6. The building of die casting and injection moulding machines by the company has led to the establishment of a die-making tool-room in the factory. The plant includes this Rigid hydraulic copy die-sinking machine

Fig. 5, which has a 5-in. diameter spindle. The workpiece seen in position is a fixed platen for a pressure die casting machine of 800 tons locking capacity—the largest in the present range—with tie bar bores of 7.086 in. diameter. These bores, and the injection aperture of 2.95 in. diameter, are bored at a single setting on this machine, which is also employed for a variety of other work, particularly on headstock castings. Equipment provided in this shop also includes a large Froriep (Charles Churchill & Co., Ltd.) horizontal borer

with a spindle of 5.118 in. diameter.

ling

atre

ove

will

k -

in.

res.

ave

ated

and

16

rom

0094

ору-

for

and

and

lock-

n in

Since the design and building of pressure die casting and injection moulding machines was begun, and on account of the increasing use of these machines in Japan, the company has found it necessary to provide die- and mould-making facilities for customers, and a well-equipped die shop has been laid out. Among the machines in this shop is a type KA 200 Rigid (Dowding & Doll, Ltd.) 3-dimensional hydraulic copying milling machine, which is shown in Fig. 6 set up for roughing operations on a die block. The first stage in the cutting of this cavity involved the machining of a rectangular recess, and the stylus was guided by a template of the required internal dimensions, supported on steel blocks at the necessary height. Other machines in this shop include Bridgeport (Catmur Machine Tool Corporation, Ltd.) die sinkers, and an Oerlikon (Dowding & Doll, Ltd.) radial drilling machine, equipped with a rotary table and outer support column.

SHIBAURA MACHINE TOOLS

Reference has already been made to certain machines from the Shibaura range, and a type TSU 20/23 vertical boring mill, exhibited at the 4th Osaka International Trade Fair, was briefly described in Machinery, 96/1218—1/6/60. Another boring mill (type TES 50/70A), with a table diameter of 16 ft. 5 in., shown in Fig. 7, will swing workpieces of up to 24 ft. 6 in. diameter. The tool slide at the left is arranged for copy-turning under the control of an electro-magnetic unit, the stylus of which is deflected by a force of about 18 oz. The copying unit is of the type in which movements of the stylus cause changes in the inductance of a coil, these changes being employed to control a magnetic clutch in the feed drive.

A d.c. motor of 130 h.p. drives the table at steplessly-variable speeds from 0.35 to 28 r.p.m., which are controlled by a dial on the pedestal in the foreground. Feed rates, which range from 0.0039 to 0.394 in. per rev., in 16 steps, are changed by an electric motor, controlled either from the pedestal or from one of the pendant panels. Workpieces



Fig. 7. An example from the range of large vertical boring mills made by Shibaura, this machine has a table of 16 ft. 5 in. diameter, and is provided with electronic copying equipment for the left-hand tool-slide

up to 13 ft. high, and weighing up to 60 tons (metric), can be machined. Other sizes of vertical boring mills-both larger and smaller-are built, and a machine with a table diameter of 3 ft. 3 in., fitted with equipment for numerical control of the movements of the tool-slide in the horizontal and vertical directions, was shown at the Tokyo International Trade Fair in 1958. The electrical equipment for this machine was made by the Tokyo Shibaura Electric Co., Ltd. (the principal stockholders in Shibaura Machine Co., Ltd.) under the trade name of Toshiba. The largest machine of this type made by the company has a table diameter of 26 ft. 3 in., and will turn workpieces up to 39 ft. 4 in. diameter.

LARGE HEAVY-DUTY LATHES

In addition to roll-turning lathes such as that shown in the heading illustration, the company builds a range of large heavy-duty lathes for a variety of purposes. One of these machines,

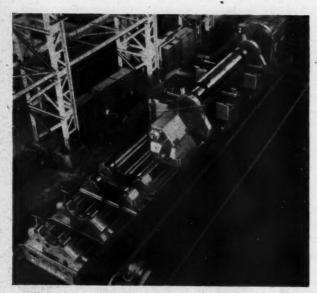


Fig. 8. Large lathes are built for roll turning and other purposes. This machine has a centre height of 3 ft. 11 in. over the bed, and will admit a maximum length of 52 ft. 6 in. between centres

shown in Fig. 8, has a centre height of 3 ft. 11 in. above the bed, and a capacity for work up to 52 ft. 6 in. long between centres, with a maximum weight of 120 metric tons. The spindle is driven by a variable speed d.c. motor of slightly more than 100 h.p., at speeds which can be varied steplessly between 0.75 and 120 r.p.m. There is no saddle feed shaft on the machine. Instead, each of the two saddles is driven by a separate d.c. motor, with thyratron control, at feed rates which can be steplessly varied from 0.0315 to 7.874 in. per min.

Feed rates available for the cross-slides are half those for the longitudinal movements of the saddles. The weight of the machine is approximately 177 metric tons. Machines have also been built by the company for boring gun barrels and other deephole drilling operations. In addition, mention may be made of grinding machines in two sizes for finishing rolls of diameters up to 31.5 and 36 in., and with a length capacity between centres of 18 ft. Provision for cambering up to 0.118 in. is made on these machines.

DRAW-CUT SHAPERS

A draw-cut shaper, the ram of which can also be fitted with an adapter for milling operations, is shown in Fig. 9, and is supplied mainly to shipbuilding and heavy engineering companies. The machine is transportable by means of slings which are attached to two heavy eyes provided, and it can be bolted down alongside large workpieces.

Two sizes are built, with ram strokes of 5 ft. 3 in. and 5 ft. 11 in., of which the larger is here shown. Movements of the head on the column enable vertical surfaces up to 6 ft. 6 in. and 13 ft. high to be machined, and the column has horizontal movements of 11 ft. 6 in. and 26 ft. 3 in. on the small and large machines respectively.

Drive to the ram, and the milling spindle which it contains, is derived from a motor of 20 h.p., supplied by a Ward-Leonard set, which provides



Fig. 9. Draw-cut shapers are made in two sizes, of which the larger, with a stroke length of 5 ft. 11 in., is here shown. The machine is transportable, and a spindle inside the ram enables milling operations to be performed

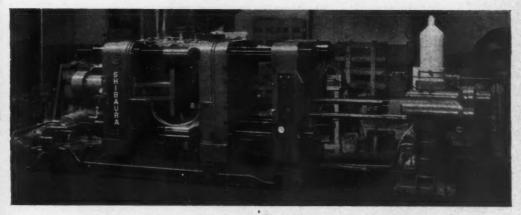


Fig. 10. Although this machine, of 800 tons locking force, is the largest for pressure die casting so far completed by the company, work on the building of a machine of 1,500 tons capacity is already well advanced

steplessly-variable speeds from 26 ft. 3 in. to 78 ft. 9 in. per min. The ram can also be fed at slower rates, from 0-019 to 0-236 in. per min., for milling operations. Spindle speeds for milling can be steplessly-varied from 6 to 160 r.p.m., and the milling head can be swivelled to any required angle to suit the work.

In connection with variable speed driving arrangements for machine tools, it may be noted that the company has a licence for the manufacture of the P.I.V. unit in Japan.

PRESSURE DIE CASTING MACHINES

Shibaura pressure die casting machines are made with locking forces from 80 to 800 tons, in both hot and cold chamber designs, and there is also a cold chamber type with vertical injection. Work is now in progress on a machine with a locking force of 1,500 tons, which is to be completed in April this year for a leading Japanese company, and we hope later to describe it in detail. The largest machine in the present range is shown in Fig. 10, and it has platens measuring 51 5 by 58 in. with tie bars of 7086 in. diameter, and spaces between the bars, in the horizontal and vertical directions, of 31 5 and 33 5 in.

Dies of thicknesses from 15.75 to 33.86 in. can be accommodated, and the die-closing stroke is 17.7 in., the movement being imparted by a double-toggle mechanism with multiple links, fitted with positive stop pads to prevent over-travel. A total injection force of 60 tons can be applied to the plunger from a nitrogen bottle, charged by a two-stage hydraulic pump to a pressure of about

6,000 lb. per sq. in. For ejection on the machine shown there is a single hydraulic cylinder, but later designs are provided with two cylinders, one at each side of the platen, which exert a total force of 25 tons over a stroke length of 4.75 in.

Mechanical clamps in the four tie-bar bosses on the moving platen can be applied to any of the tie bars to enable them to be withdrawn for diechanging operations, if necessary. The weight of the moving platen, and of the die half which it carries, is taken on flat surfaces on the weld-fabricated steel plate bed, and adjustments for wear are made by means of wedges. For lubrication of these and other sliding surfaces on the machine, there is a system of feed pipes connected to a one-shot hand-operated pump unit on the moving platen at the left.

A feature of Shibaura machines, of 175 to 800 tons locking force, is the provision of a patented unit, known as a tension meter, in each of the four tie bars at the moving-platen end. Each tie bar is drilled longitudinally, to a diameter of about ½ infor a depth of slightly more than 39·37 in., and in this hole is fitted a steel measuring rod. At the outer end of the tie bar, is machined a recess to take a dial gauge, the face of which is graduated in tons. The plunger of this instrument is springloaded into contact with the end of the steel measuring rod, and provision is made for the body of the instrument to be adjusted in the direction of the tie bar axis, and locked in position.

When the tie bar is stretched, by application of the die-closing force exerted by the toggle mechanisms, the steel rods can move slightly in an axial direction, under the pressure applied by the



Fig. 11. This die spotting and inverting machine has a table with an area of 23.6 by 59 in., and a beam which can be raised and lowered hydraulically, and rotated manually by a worm drive

instrument plungers, with the result that the needles move round the dials. When the instruments are fitted, the forces exerted on the tie bars are equalized, with the aid of strain gauges and electrical measuring equipment. The dial gauges are then adjusted axially so that each gives a similar reading, and the sum of the readings is the rated locking force applied by the machine.

Subsequently, the setting up of a new die is facilitated by the dials, which clearly indicate any variations in the loads borne by the tie bars, and enable rapid adjustment of the nuts to be made. Other features of Shibaura die casting machines include manifold mounting arrangements for control valves, to reduce the number of joints at which leakages of fluid can occur, and equipment for the automatic control of the entire casting cycle. This equipment provides for the selection of several different sequences of movements of the machine elements, to allow for the use of moving cores, the placing of loose cores or inserts, and the application of die dressing or lubricant.

Timers are also provided, on the cabinet housing the control equipment, for varying the durations of the various stages of the casting cycle, also for controlling the injection phase which takes place in three stages, in accordance with current Western

practice. Views of Shibaura die casting machines in operation were included in an article on the Japanese die casting industry which was published in MACHINERY, 97/740—28/9/60.

DIE SPOTTING AND INVERTING MACHINE

A piece of equipment which was regarded by the company as a necessary complement to their range of die casting units is the die spotting and inverting machine-colloquially known as a die flipper—shown in Fig. 11. This machine has a table measuring 23.6 by 59 in., with transverse Tslots so that one half of a die can be secured to it. At each end of the base there is a vertical dovetail slideway on which a column can be raised and lowered by a hydraulic cylinder. A trunnionmounted beam, at the tops of these columns, can be rotated manually by means of a worm drive at one side, the angle being indicated by a pointer on the end of the nearer trunnion, which moves round a graduated dial.

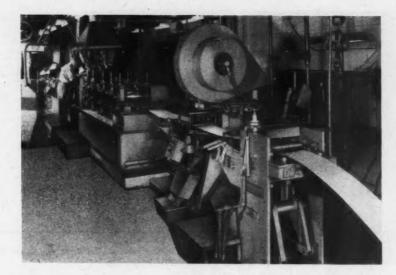
The beam can be locked with its face parallel to that of the table by means of two tenons which enter slots in the end faces and are clamped to the ends of the columns by lever nuts. Trials of the opening and closing action of a die, and of any cores which may be fitted, can be carried out with the die halves clamped to the table and the beam. Drilling or boring of through holes for locating dowels or guide pins can also be performed by means of the light radial drill mounted behind the machine. When closing or opening dies, forces up to 10 tons can be exerted by the cylinders, which are supplied with oil from a motorized pump unit inside the base.

Further articles concerned with machine tool factories in Japan, and with other Japanese metal-working plants, will be published shortly.

© The Machinery Publishing Co., Ltd., 1961.

LIPTON AUTOSTAK ATTACHMENT FOR FORK TRUCKS.—Lipton Products, Ltd., Wooburn Green, Bucks., have developed an attachment for fork lift trucks, known as the Autostak, which enables any pallet loading height to be pre-selected. The attachment comprises an adjustable position sensing unit on the mast of the truck, an electromagnetic lock which is attached to the existing hydraulic lift lever, and a push button. When the button and the lift lever are operated, the latter is maintained in the engaged position until the selected height is reached.

This arrangement is claimed to be of particular advantage where height must otherwise be judged at steep angles, and during elevation the driver has both hands free to manœuvre the truck.



Efficient Production System for Dynamo and Starter-motor Housings

As a result of changes in the design of dynamos and starter motors, and particularly of the housings, the Electric Autolite Co., Toledo, Ohio, U.S.A., have been able to introduce highly efficient methods, whereby the housings are produced from coils of flat stock on a continuous automated line.

die a f-t. iil id n-in at on he

he ny th

m. ng by he

ces

rs.

ed

ool

al-

DRK

en,

ork

oles

The

ion

tro-

ing

hen

the

ntil

ular

ged

iver

The new frame comprises a light-gauge inner member of standard length and diameter, and of adequate strength to support and align the end covers, and a comparatively narrow sleeve of heavier gauge, which is pressed over it. With this design, the starter-motors and dynamos are lighter in weight; metal is concentrated where it is needed, in the field coil area, to provide an improved magnetic flux path; and the fact that comparatively thin material is used for the main, or inner, frame member, considerably facilitates manufacture of this component.

INITIAL OPERATIONS ON INNER FRAMES

The first portion of the automatic production line incorporates a continuous Yoder rolling mill to which special equipment has been added. Rough-formed inner frames produced with this equipment are delivered to a second section, where the outer portions are assembled and finishing operations are performed. To balance flow rates between the two sections, the latter comprises three identical lines, as seen in Fig. 1.

When dynamo frames are being produced, coils of 0·125-in. thick mild steel, at 12% in. wide, are placed in a cradle at the head of the line. Either hot- or cold-rolled steel can be used, but hot-rolled material is preferred. The cradle accommodates two coils, from one of which the strip is drawn while the other serves as a reserve.

After it has passed through straightening rolls, the material enters a squaring unit, as seen at the right in the heading illustration. It is here that the rear end of one coil is joined to the front end of the next to avoid interrupting the feed of the strip along the line. A shear blade in the unit squares off the ends of both strips, after which they are butted together, locked in place by crossbars and toggle clamps, and arc-welded by hand. The bead is then ground flush and feeding continues, only about 7 min. being lost.

Because the cylindrical frames are made from

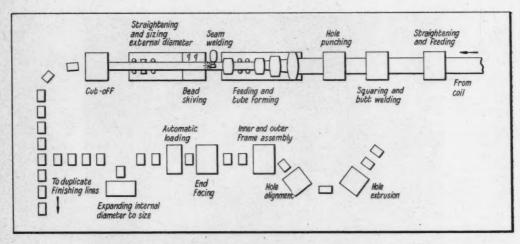


Fig. 1. The fully automatic line is fed with steel strip from a coil at the upper right, and delivers assembled dynamo and starter-motor housings

flat material, it is possible to punch all the openings required before forming is begun. This operation is carried out at the next position, seen in Fig. 2, where seven holes and two locating slots are punched by a flying die. With the tool in the position shown, a pawl in the housing A drops into a locating slot punched in the previous

operation cycle, to lock the die to the metal strip. It is stated that the determination of the correct size and location of the holes was one of the principal problems when this method of production was being developed.

Continued travel of the strip pulls the die to the left until a limit switch B is released, with the

fresult that the press is tripped. If, for any reason, this switch fails to operate, a projection on the die will strike the limit switch C to shut down the entire line. When the die closes, the pawl is caused to pivot upwards to release the strip. As the punches clear the work, heavy springs return the die to its starting position, and the pawl rides along the surface until it drops into the next locating slot.

th

b

to

SE

fo

cl

T n B

m

st

tl

tl

t

n

tl

To reduce the number of dies required for the various types of Autolite housings, several of the punches are eccentrically mounted. In this way, the hole spacing produced by any particular tool can be varied within a certain range.

Pairs of centring rollers guide the punched strip as it enters the main bank of Yoder forming rolls. There are ten sets of rollers in this bank, some of which are mounted horizontally, and some vertically, as seen in Fig. 3. The two rolling stands at the right provide for initial forming of

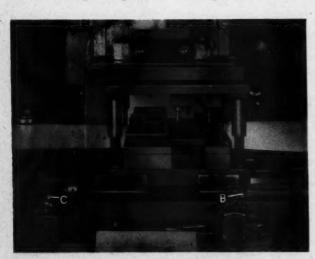


Fig. 2. This flying press tool punches all the holes and locating slots required for one inner housing at a time without interruption of the feed movement

the metal strip, the sides being turned upwards, to give a concave cross section, as seen at D and E

At a later stage, an approximately tubular form is produced as the edges are progressively closed between two pairs of vertical rollers at F. This action can be seen more clearly in Fig. 4. Beyond the stand shown at the left, there is one more pair of vertical rollers and one more stand of horizontal rollers, which complete the tubular shape in preparation for seam welding.

In the welding area, the tube passes between two more vertically

ct

he

C-

he

he

If. to ill vn es, ds es rn ndtil ies of he ed. robe he ain ere nk, nt-

in

the

of

mounted rollers, as seen in Fig. 5, which support the sides and ensure correct joint clearance for the continuous weld. Coated electrode wire is fed from a spool to a Lincoln welding head. A current of approximately 850 amp. at 23 volts is employed, which is varied slightly from time to time to main-

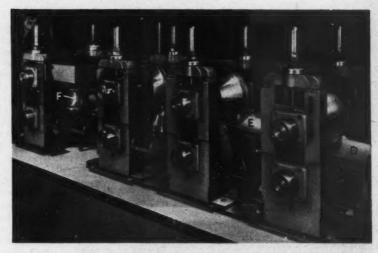


Fig. 3. Ten sets of rolls in this section of the line form continuous tube from flat strip. The shape begins to change at D

tain a consistent quality in the welds produced.

There are two points in connection with the welding operation to which attention may be drawn. Firstly, the arc must not be permitted to burn through the tube wall which, on account of the comparative thinness of the metal, is a



Fig. 4. A close-up view of the rolls at F in Fig. 3. Tube forming has here reached an advanced stage. The bracket G supports one end of a 20-ft. long anvil rod within the tube



Fig. 5. The formed tube is continuously seam welded, coated electrode wire being employed. A water-cooled copper shoe held against the inside of the seam prevents are burn-through



Fig. 6. At the end of the tube-forming line, a guillotine blade *H*, which forms part of a flying tool, cuts off the individual housing lengths. The chute in the foreground leads to the secondary lines

distinct possibility. Secondly, the weld bead must not protrude beyond the inner surface of the tube.

Both these conditions are avoided by the use of an internal anvil, or welding shoe. This copper anvil is pressed firmly against the inside of the joint by a heavy spring. The anvil and spring, in turn, are supported by a 20-ft. long anvil rod which extends within the tube. Referring again to Fig. 4, the bracket whereby one end of the rod is supported is seen at G. Two copper water tubes, which are also visible in this illustration, lead into the tube and thence to the welding shoe. Water cooling of the shoe is essential because of the great heat to which it is subjected directly beneath the arc.

Two internal rollers are mounted on the long rod just beyond the welding area to prevent distortion of the tube while the welded seam cools. A group of water jets is played against the seam to accelerate the cooling process. At the end of the rod there is a circular felt wiper sandwiched between two metal washers, which serves to hold back any foreign matter or weld splatter that may have collected within the tube.

th

Pt t aff

Immediately beyond the welding station there are two formed, brazed carbide skiving tools. These tools are mounted on individual, adjustable, overhead slides whereby they can be raised or lowered as required. The first tool rough-cuts the weld bead while it is still at red heat, and the second tool, which is just behind, takes a finishing cut on the remaining raised portion of the bead, to bring it flush with the tube surface.

Next, the tube is straightened by four sets of rolls, and it is then cut off into individual frames at the operation shown in Fig. 6. The tube enters a cutting-off die in a Johnson OBI press. Here, as at the operation previously described, a pawl in the die engages one of the locating slots in the tube. As a result, the die is forced to travel with the tube until the press is tripped and a guillotine blade H slices off a length sufficient to form one frame. As at the first press operation, a limit switch shuts down the entire line if the die should fail to disengage from the tube and be carried too far to the side.

On the discharge side of the press, the inner frames drop down a chute on to an inclined conveyor which raises them to a horizontal belt serving the three secondary sections of the automatic line.

The speed of the initial section of the line is

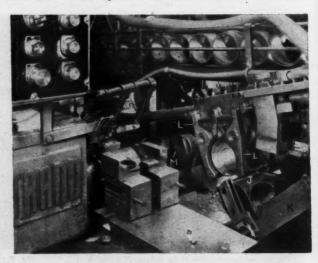


Fig. 7. This automatic lathe faces and chamfers both ends of an inner housing simultaneously, to bring it to the correct overall length. A line of outer housings is seen overhead

adjustable from the main console, and the best results have so far been obtained with the tube moving at the rate of 10 ft. per min.

d

re

e,

or

ne

ng

to

of

at

a

as

e.

)e

H

As

its

is-

he

er

n-

v-

is

OPERATIONS ON THE SECONDARY LINES

Still in an uninterrupted flow from the cutting-off press, the inner frames are delivered to one of the three secondary lines for further operations. The three lines are identical and automatic gate deflectors direct the lengths of tube to lines that have sufficient space to accommodate additional parts.

As the frames roll down one of the final lines, they are first stopped at a sizing station. Here, each part is pushed from the line and slipped over a hydraulic expanding mandrel which is then energized. This stage is important, because the internal size and shape of the frame must be held to close limits to ensure that there will be an air gap of the correct size between the fields coils and the armature.

In addition to sizing, the operation serves a second purpose. Sufficient expansive force is exerted on the inner housing member to check the quality of the seam weld. Should the quality be below the acceptable level, the seam will split open. For a final machining operation, the inner members roll down an inclined chute (after being automatically ejected from the sizing mandrel) to a loading location J in front of the No. 6A Sundstrand automatic lathe, seen in Fig. 7. When a part is to be transferred to the lathe, the pivoting arm K lifts the first piece from the chute and snaps it into place between loading fingers L of an overhead shuttle arm. It may be noted that as the arm K swings upwards, a motor is energized which causes the This rotation serves to housing to rotate slowly. orientate the parts so that when each is transferred to the lathe mandrel, it is located from the same point on the sheared face. The "low" point is, in fact, the base of a locating slot cut in half by the guillotine blade at the end through which the guillotine cut passes when the housing is severed from the tube at the end of the first section of the line.

When the loading fingers deliver a part to the work area, a tailstock plunger M pushes it from between the fingers and on to the mandrel. Two cutters on the cross-slide are then fed in to face and

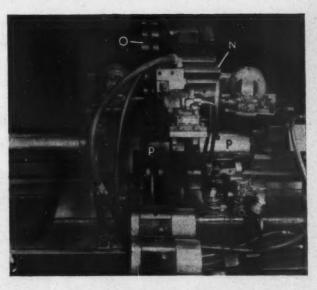


Fig. 8. This automatic machine orientates and assembles outer and inner housings. Completed assemblies, ready to receive the pole pieces, are seen in the foreground

chamfer both ends of the housing at the same time.

AUTOMATIC ASSEMBLY MACHINE

As the tools retract, the housing is slipped off the mandrel and dropped behind the lathe into a chute leading to a Grotnes assembly machine, which is the last automatic unit in the line. Here, as seen in Fig. 8, the inner and outer housings meet and are joined to form the assembly.

The inner housings arrive from the automatic lathe in the chute N at the rear. Narrow, split outer frames are delivered by an inclined chute O at the left. An elevated line leads directly from the press that punches and forms the outer members, and can be seen extending above the inner housing line along the top in Fig. 7.

One housing member of each type is allowed to roll to the pre-assembly positions P, Fig. 8. At this position, they are rotated for correct orientation in relation to each other, the outer housing being located from a hole, and the inner housing from a notch. The actual assembly operation is simple, two Hannifin air cylinders being employed to press the two members together. Because the outer frame has an open seam, it can spring during assembly and the need for a close-tolerance fit between the members is thus avoided. Assembled frames can be seen in the foreground.

Each assembly is then placed by hand on a small press where a drift pin aligns corresponding holes in the two members. On a second small press, metal from the wall of the inner housing is extruded outward into a hole in the outer housing (at one point only).

This small extruded portion serves to prevent movement between the two parts until the pole pieces are added inside the housing. At this stage, screws are passed through both the outer and inner frame members and into the pole pieces, to lock the entire assembly together.

Frauenthal Precision Copy Turning, Boring and Grinding Machine

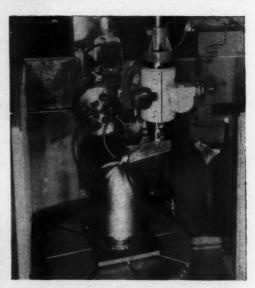
The Frauenthal series 900 vertical turning, boring and grinding machine recently introduced by the Kaydon Engineering Corp. Muskegon, Michigan, U.S.A., is shown in Fig. 1 set up for turning a semi-spherical shape on a cylindrical component. A close-up view of the working area

is given in Fig. 2.

This machine incorporates a new electrohydraulic copying system which, it is claimed, enables workpieces to be produced to within ± 0.00015 in. for profile shape, with constant feed per revolution. In conjunction with this system, a recorder is provided which shows the accuracy of the follower and tool movements in relation to the template form. A heat exchanger is provided which ensures that the hydraulic fluid is maintained



Fig. 1. Frauenthal series 900 vertical copy turning, boring and grinding machine, introduced by Kaydon Engineering Corp., U.S.A.



for

for

scr

dir

Fig. 2. Close-up view of the working area of the Frauenthal machine showing the set-up employed for turning a hemispherical shape on the end of a cylindrical component

at a constant pre-set temperature to close limits. Fitted with a 30-in. diameter work-table, which has a precision-ground T-slotted top surface, the machine will swing workpieces up to a maximum diameter of 36 in.

The cross-slide saddle has a maximum travel of 32 in. on the column ways, and the tool slide can be adjusted by hand, in the vertical direction, for a maximum distance of 3 in. An automatic, force-feed lubricating system is provided.

Gaston E. Marbaix, Ltd., Devonshire House, Vicarage Crescent, London, S.W.11, are the distributors in this country for the Kaydon Engineering

NEW PRODUCTION EQUIPMENT

Edited by G. W. Mason and A. J. Barker

Crossley-Trurnit Pointing and Cold Forming Machines for Wood Screws

World-wide manufacturing and selling rights for the Trurnit pointing and cold forming machines, of Continental design, which have been developed for the high-speed production of wood screws, have recently been acquired by Crossley Brothers, Ltd., Openshaw, Manchester, 11. British-built machines, which are marketed under the trade name Crossley-Trurnit, will be displayed by the company at the forthcoming Engineering, Marine, Welding and Nuclear Energy Exhibition.

During the operating cycles of these machines, screw threads are formed in steel blanks by the hammering action of dies which are rapidly rotated, and are simultaneously reciprocated in a radial direction at speeds up to 6,000 strokes per min.,



Fig. 1. The Crossley-Trurnit pointing machine, here shown, provides for simultaneously machining a taper and two or three threads at the end of a blank for a wood screw

C,

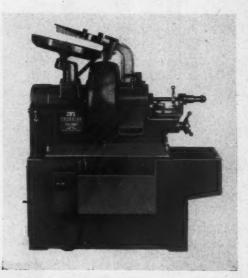


Fig. 2. Following the pointing operation on the machine shown in Fig. 1, the wood screw threads are cold formed and completed automatically on this Crossley-Trurnit machine

by means of a hollow cam. With this arrangement, screws can be produced in a cycle time of 1 to 3 sec., depending upon the size, and the improved grain formation of the workpiece metal, which results from cold working, it is stated, results in an increase in strength of as much as 20 per cent. A good surface finish is obtained on the threads, and the hammering action results in an increase in the length of the blank of the order of 15 to 20 per cent, so that there is a corresponding saving in the amount of metal required for the production of screws.

Designated type A.3, the pointing machine shown in Fig. 1 provides for machining a taper and two or three threads at the end of the blank. When this operation has been carried out, the partly-formed screw is passed to the type H.3 cold forming machine, shown in Fig. 2, on which

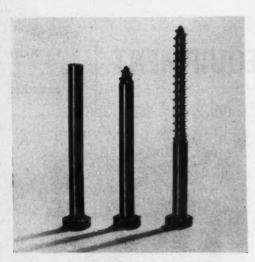


Fig. 3. In this illustration are shown (left) a blank, (centre) a pointed component, and (right) a completed roofing screw on which the remainder of the thread has been cold formed. The extended length is clearly indicated

the remainder of the thread is produced. At the left in Fig. 3 is shown a 3.5-in. long blank for

a 0.276-in. diameter roofing screw, and a component on which the pointing operation has been carried out is shown centre. The completed screw shown at the right, which has been produced from a similar blank, has an overall length of 4.331 in., and, by comparison, clearly indicates the saving in raw material which is effected by the process.

Of patented design, the machines are fitted with hopper feed units for handling blanks and partly-formed components, and have a capacity for producing wood screws in diameters from 0.236 to 0.354 in., and lengths from 2.362 to 5.118 in., which may have deep threads of coarse pitches. Usually two pointing machines are operated in conjunction with three forming machines, since the cycle time required for the former operation is shorter than that for the latter. With such an installation, screws of the type shown in Fig. 3 can be produced at the rate of 3,660 per hour.

Rockford Fully-automatic Shaping Machine

An automatic shaping machine, for incorporation in a conveyorized line for the production of "wrapped" bearings, has been built by the Rockford Machine Tool Co., Rockford, Ill., U.S.A., who are represented in this country by Rockwell Machine Tool Co., Ltd., Welsh Harp, Edgware Road, London, N.W.2.

str

hig

in

Pre

fee

wh

he

pro

de

is

ag

ar

op

Re

fre

sn

su

fla

of

in

no

be

is

vi

th

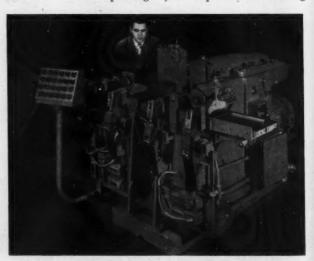
st

d

pott

Flat steel blanks for the bearing shells are delivered to the machine, and a fresh blank is accommodated at a position at one side of the path of the ram. During the operating cycle, one end of this blank is shaped square and is also bevelled. After completion of this stage, the work is transferred automatically to a similar position at the other side of the ram path, and a fresh piece is fed to the first position. The opposite end of the first blank is shaped to the same form, during the next operating cycle, also the leading end of the fresh blank. When the next transfer movement occurs, the finished part is discharged on to the conveyor. The machine is shown in the accompanying illustration with the covers removed from the transfer and clamping equipment. It is based on the company's standard 24-in. hydraulic shaping machine, which is driven by a motor of 10 h.p.

The operating cycle requires nine cutting



Developed for incorporation in a conveyorised line, this Rockford fully-automatic shaping machine provides for squaring and bevelling the ends of steel blanks

strokes, which are made at a speed of 50 ft. per min., the return speed being 100 ft. per min. Four high-speed steel cutting tools are employed, which are ground to an identical form, and are mounted in two holders carried on a special tool-head. Provision is made for pre-setting the tools. Downfeed is applied automatically by means of a cam, which is turned by a ratchet system, and the tool-head is thrust against this cam by a hydraulic cylinder. During the return stroke, this cylinder provides for relieving the tools. When the predetermined depth has been reached, the tool-head is automatically raised, and is then positioned against positive stops by an air-operated arrangement, in readiness for the next cycle.

a-

of

k-

ho

ell

re

re

is

he

ne

SO

ork

on

sh

ite

m, ng

fer ed

he

red

is

ilic

of

ing

A special cross-rail is fitted, and the work clamps are hydraulically operated. The transfer mechanism is interlocked with the controls for the shaper, and the machine is stopped in the event of faulty operation.

Morrisflex-Hammond CFT 40 Semi-automatic Profile Polishing Machine

B. O. Morris, Ltd., Morrisflex Works, Briton Road, Coventry, are now building, under licence from the U.S.A., the Morrisflex-Hammond CFT 40 semi-automatic polishing machine here shown, which is primarily intended for handling relatively small batch quantities of profiled components, such as car window vent frames and clock bezels.

A workpiece to be polished is clamped on the flat surface of a special fixture, to the under-side of which is attached a downwardly-projecting guide strip. This strip is formed to a shape corresponding to that of the work. In operation, the fixture is positioned on the work-table so that the inner face of the guide strip abuts a roller, which normally projects above the table surface but may be retracted, to facilitate loading. Next, pressure is applied to this roller by an air system, with provision for adjusting the load, to urge a roller chain that extends along the outer face of the guide strip into engagement with a horizontally-mounted driving sprocket. With this arrangement, the workpiece is automatically traversed past the polishing mop, and low-friction pads, attached to the lower edge of the guide strip, provide for easy movement of the fixture across the table surface.

Drive to the sprocket is taken from a ½-h.p., variable-speed motor, which is housed in the base of the machine, and traverse rates from 5 to 16 ft. per min. can be obtained. A work-table measuring either 40 by 30 in. or 60 by 40 in. is fitted, and provision is made for the attachment of brackets for supporting extension plates, to increase the available area.



Morrisflex-Hammond type CFT 40 semi-automatic profile polishing machine

Mounted on a separate stand at the rear, the polishing head may be of either light- or heavyduty type, and is universally adjustable so that the mop can be set at the optimum angle to the work. The light-duty unit, which is designated 54/102, incorporates a motor of either 3 or 5 h.p., the largest mop that can be accommodated being 12 in. diameter by 3½ in. wide. A motor of 5, 7½, or 10 h.p. can be provided for the type 50/81 unit, which will admit mops up to 16 in. diameter by 5 in. wide. Alternatively, a "floating" head can be supplied for use when polishing contoured work. Polishing composition is applied to the mop by a spray gun, and is supplied automatically, from a container by an air-operated system. This system is controlled by cams, which may be adjusted for varying the intervals at which composition is delivered. An abrasive belt grinding attachment is available for use in place of the polishing mop.

M.A.E. Hydraulic Presses with Broaching Equipment

The M.A.E. hydraulic presses up to 16 tons capacity, made by Maschinen-und Apparatebau G.m.b.H., Erkrath, Düsseldorf, West Germany, can be fitted with equipment for performing pull broaching operations, as seen in the accompanying



M.A.E. type Hy-S-16 ZR hydraulic press with automatic broaching equipment

illustration, which shows a 16-ton type Hy-S-16 ZR press.

In operation, the broach is loaded into the upper broach holder and the workpiece placed in position on the table. The cycle is then started, and when the broach end has passed through the workpiece it is gripped by a locking device on the lower holder, and pulled through the work from below.

After the broach teeth have passed through the workpiece, the broach is automatically released from the upper holder and pulled clear by the lower

holder so that the work can be unloaded. After removal of the finished piece, the lower holder moves up with the broach. Cams on this holder release the broach, which is then automatically gripped by the upper holder and raised clear of the table to allow another workpiece to be loaded. The equipment can be arranged to carry two broaches if desired. Stroke lengths on the standard presses range from 19% to 35% in. depending on capacity.

These M.A.E. presses are of steel construction, and are built in sizes up to 100 tons, or more if required. The types Hy-T, of 2% and 6 tons capacity, are arranged for bench mounting. Presses of 1-ton capacity can be supplied for group mounting on a bench, and arranged for operation from a common hydraulic pump. The 6-ton press is also available as the type Hy-E with column mounting.

Presses can be provided with ejector pistons in the tables, and can be arranged for two-handed safety operation. In addition, presses are obtainable for operation on a pre-set automatic cycle, with fast traverse, and other modifications to the standard designs include the fitting of adjustable tables, and tables of larger sizes.

The sole agents in this country for M.A.E. presses are Broadway Equipment, Ltd., Parway House, 194-196 Finchley Road, London, N.W.3.

Warner & Swasey Type O-AC Single-spindle Chucking Automatic

Shown in the accompanying illustration is a single-spindle chucking automatic which has been introduced by the Warner & Swasey Co., Cleveland, Ohio, U.S.A., who are represented in this country by Drummond-Asquith, Ltd., King Edward House, New Street, Birmingham, 2. Designated O-AC, this machine will accommodate work with approximate maximum dimensions of 3 in. diameter by 3 in. long, and is intended primarily for the production of small-quantity batches of precision components, for example, for computers and missile guidance systems.

in

cr

or

by

vi

fo

m

ca

th

th

th

re

Il b

ca m 2 ti bi cl fe

n

C

fi

u

h

tl v v d e tl c

PPuis

Main drive is taken from a 5-h.p. motor, and there is a total of 16 spindle speeds, in four ranges from 87 to 2,507 r.p.m., the range required being selected by means of change gears. Drive is transmitted through a 4-speed, constant-mesh helical gear system, which incorporates a series of hydraulic clutches. These clutches are operated by means of numbered trip dogs, that may be set on a control drum. With this arrangement, a fresh spindle speed, within the selected range, can be obtained automatically for each tool position. If required, moreover, the speed may be changed during the cutting stroke of any tool. A 6-in. diameter air-operated chuck is mounted on the spindle nose.



Warner & Swasey type O-AC single-spindle chucking automatic

A total of 18 feed rates from 0.001 to 0.083 in. per rev. is available for the turret and the cross-slides, three of which can be brought into operation automatically during a working cycle, by means of dogs on the drum mentioned previously. In this way, the feed rate can be changed for each tool position or during the working stroke. Gears are available for cutting threads from 11% to 4 per in., and the drive can be reversed automatically, for withdrawing solid-type taps or dies.

The 5-position turret is carried on a forged bar, which is mounted horizontally in the headstock casting, above the spindle, in two widely-spaced bearings. With this arrangement, it is claimed, the turret and spindle mountings are subjected to the same rise in temperature in operation, and the risk of misalignment is thus considerably

reduced.

s a

een

eve-

this

vard

ated

with

dia-

rily

of

iters

and

nges

eing e is nesh

eries

ated

set

t, a

nge,

osi-

be

A on

Sciaky SP. 0 Bench-mounted Spot Welding Equipment

Designated 369B, the latest SP. 0 spot welding equipment made by Sciaky Bros., Inc., Chicago, Ill., U.S.A., who are represented in this country by Sciaky Electric Welding Machines, Ltd., Falmouth Road, Trading Estate, Slough, Bucks., can be supplied as a number of separate units or mounted on a bench measuring 3 ft. 6 in. by 2 ft. 6 in., as shown in the accompanying illustration. If required, multiple welding head assemblies can be arranged in a single set-up, and it is claimed that the equipment, which is also suitable for projection welding, enables such metals as nickel, tantalum, molybdenum, and kovar, also copper-clad materials, to be joined without difficulty.

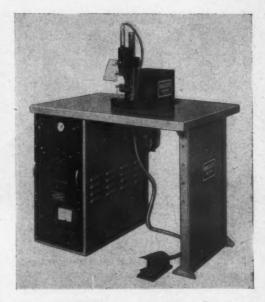
Electrodes from % to % in. diameter can be

used, and provision is made for mounting the holders, which are held horizontally, at the front, the rear, and both sides of the clamping blocks. With this arrangement, electrodes can be provided, on one head assembly, for as many as four different welding operations. The lower and upper electrode holders are carried by a bronze arm and the welding head, respectively, and these members can be adjusted vertically on a 11/4-in. diameter pillar. The throat depth is 3 in. Mounted in two precision ball bushings, the clamp block for the upper electrode holder has a stroke of 17 in., and is air-operated. A valve enables the initial downward movement to be made at a slow rate, if required, and the force obtainable between the

electrodes, which can be varied from 2 to 38 lb.

when using compressed air at 80 lb. per sq. in., is

applied by a 116-in. diameter, diaphragm-type, stainless steel cylinder. The welding head assembly



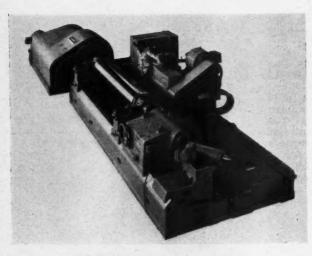
The latest Sciaky SP.0 spot welding equipment, for joining small parts of a wide variety of metals, is here shown mounted on a bench

weighs approximately 40 lb., and occupies an area of 10 in. by 19 in. A range of transformers, with ratings from 300 VA to 2 kVA, is available for supplying the welding current.

To enable a wide range of welding conditions to be obtained, the control equipment incorporates a pulse firing power system, in addition to a conventional a.c. system with a thyratron contactor, synchronous timer, and provision for heat adjustment. An "up slope" unit is available for use with the latter system. When the former system is in use, very high energy is released in about 1 millisec., and the amount of heat which is dissipated throughout the work during the welding cycle is thus limited. The control units are of the plug-in type, and the equipment is housed in a cabinet which is mounted, on rollers, in one pedestal of the bench.

Farrel-Birmingham Heavy-duty **Roll Grinding Machine**

With capacity for work up to 60 in. diameter by 20 ft. long, the heavy-duty roll grinding machine here shown is the first of a new range which is being introduced by the Farrel-Birmingham Co., Ansonia, Conn., U.S.A. The grinding wheel-head



Farrel heavy-duty roll grinding machine

of this machine is mounted on trunnions, and is tilted for fine in-feeding. Motion is applied through a system of levers and the arrangement is similar to that employed by the company for obtaining a "crowning" action. Owing to the low friction obtained with this design, which is patented, it is claimed that feed and withdrawal of the grinding wheel can be effected with a high degree of accuracy.

After a selector switch has been set to a "manual" position, fine feed can be applied by means of a hand-wheel, which is graduated in divisions of 0.0001 in. Smooth movement is obtained, without backlash, and a stop is provided which permits the wheel-head, after having been withdrawn, to be returned accurately to the previous position. Alternative positions on the selector switch provide for power operation of the in-feed, either to compensate continuously for wheel wear or to ensure the maintenance of a constant load on the grinding wheel. To facilitate the initial positioning of the wheel-head assembly, power traverse rates of 28 and 2 in. per min. can be engaged by means of push-buttons.

New Tornos Single-spindle Automatics

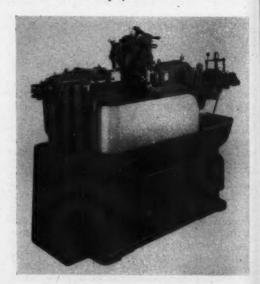
New sliding headstock single-spindle automatics, designated type MR-28 and type MR-32, have recently been introduced by the Swiss firm of Tornos, and are intended to supersede their type M.25/28 machine.

The new machines, one of which is shown in

the figure, have capacities for bar stock up to 132 in. and 114 in. diameter, and enable work to be turned for a maximum length of 4 in. under the control of a plate-type cam, and 716 in. when a bell-type cam is employed. Holes can be drilled in the work for depths up to 21/2 in., and the maximum length of thread that can be cut is 2¼ in. Drive is taken from a 4%-h.p. motor, and 13 spindle speeds are obtainable, which range from 510 to 3,500 r.p.m. The spindle runs in the company's patent Micronic needle roller bearings at the nose end, and push-buttons, built into the base, provide for starting, stopping, and "inching" the drive.

An arrangement is incorporated which stops the machine at the end of the cycle, when the bar stock is of insufficient length for the production of another piece, and a signal lamp is then lit. A 35-mm. (1.377-in.) dia-

meter camshaft is usually fitted, but a 30 mm. (1·181 in.) diameter shaft can be provided, if required, to take cams which have already been prepared for use on a type M. 25/28 machine. The range of attachments available for the earlier automatic can be employed on the new machines.



One of the new Tornos type MR single-spindle automatics

The makers are represented in this country by Tornos Sales Co. (E. M. Vaughan, Ltd.), Broadgate House, Coventry.

Precisa FS 2 Swinging-head Type **Bench-mounted Surface Grinder**

ar

ia-

ed

der nd

m-

the

the

be

a

eds

510

in

dle

and

oro-

ch-

ted

d of

in-

a of

o is

dia-

nm.

een

ine.

rlier

nes.

Intended for bench mounting, the Austrian-built Precisa FS 2 vertical-spindle, swinging-head surface grinding machine here shown is being marketed in the United Kingdom by The H.G. Stevens Co.,

Ltd., 16 Coverdale Road. London, N.W.2. It is stated that surfaces up to 7% in. diameter and 12 by 6 in. or 16 by 4 in. can be covered without resetting.

Of 1½ in. diameter, the wheelhead spindle is mounted in preball cision roller bearings, and is balanced dynamically in conjunction with the rotor of the 3-h.p. driving motor. A 7%-in. diameter cup grinding wheel can be mounted spindle the nose, and a segmental-type unit is available, quired. For wheel dressing, a unit



for attachment to one side of the head, and it can be brought into use without altering the setting.

Provision is made for tilting the entire head, for hollow grinding, and it can be adjusted vertically on the 31/2-in. diameter pillar by means of a handwheel. Graduations of 0.00025 in. on the periphery of this handwheel are observed through a Movement is applied to the magnifying lens. head through a hardened screw and nut, and the latter can be adjusted to compensate for wear. The screw is protected against dust by leather bellows and a labyrinth seal. A maximum distance of 6½ in. is obtainable between the surface of the work-table and the face of a new grinding wheel, or up to 9½ in. with a worn wheel. The spindle head can be swung through 180 deg. about the

pillar for grinding thicker work supported on the bench at the rear.

Coolant equipment is available, and the machine weighs approximately 3½ cwt.

Mapal Adjustable Hand Reamers

Monks & Crane, Ltd., Garretts Green Lane, Birmingham, 23, are the sole British distributors for the Mapal adjustable hand reamers, examples of which are shown in the accompanying figure. The reamers are available in eight sets covering bore sizes from 0.315 in. to 2.5 in., and each has only one blade, with zero top rake.

This blade is expanded and retracted by means of the ball-ended lever on the holder, and the reamer can be adjusted from its nominal major diameter to a size which is 10 per cent smaller. A scale on the holder indicates the cutting size, and the blade can be expanded while the reamer is in the work bore. The reamer body is chromium plated and precision ground.

For re-sharpening, with the blade in position in the body, the outer surface is ground on a surface grinder. A flat is provided on the body, opposite the blade, for location purposes, and grinding is performed longitudinally. It is stated that a high surface finish, free from chatter marks, can be obtained on the work, and that the reamer has unusually long life.



Typical example of a set of Mapal adjustable single-blade reamers

Ultrasonic Cleaning of Spectacle Frames

REFERENCE HAS ALREADY BEEN MADE, in articles published in Machinery, 98/553-8/3/61 and 98/706-29/3/61, to some of the interesting methods employed by the British American Optical Co., Ltd., at their Radlett Road, Watford, works, for the production of metal spectacle frames. A substantial part of the factory is concerned with the manufacture of plastics frames, which are cut from solid sheet by a series of ingenious routing operations, formed to shape, and finished by barrelling and polishing. Examples of such frames in the finished condition are seen at the left in Fig. 1. After certain frames of this type have been assembled, it is necessary to polish out small scratches and other imperfections with a wax-like compound which adheres strongly to the plastics, as seen on the examples at the right in Fig. 1.

Until recently, great difficulty was experienced in removing this wax from the polished surfaces, and especially from hinge joints and other crevices. Cleaning was carried out by first soaking the frames in a solution of soluble oil to soften the wax, then rubbing it off with a cloth, and finally picking the residue out of the crevices with pointed instruments, a most tedious task. These difficulties have been solved by the installation of a small unit in which the cleaning fluid is agitated ultrasonically, to speed up and intensify its action. became apparent that the initial unit was too small for the treatment of the large numbers of frames which were likely to benefit from cleaning in this way, and a second, much larger unit, has therefore been installed.

Seen in Fig. 2, this second unit was made by

the German firm of Schoeller & Co., Frankfurt on Main, who are represented in this country by Roto-Finish, Ltd., Hemel Hempstead. The plant consists of a sheet metal cabinet in which there is a vitreous-enamelled tank to hold the cleaning fluid. This tank measures some 51 in. long by 14 in. wide, and is 12 in. deep for most of its length, a square portion at the right-hand having a depth of 15 in. Thermostatically-controlled electric heating elements beneath the tank maintain the Grisiron solution at a temperature of 120 deg. F., to soften the polishing compound, this temperature being the maximum that can be used without affecting the plastics material of the frames.

TWIN TRANSDUCERS

Another view of the tank showing the righthand end, is given in Fig. 3, and in the bottom of the deeper portion there are two laminated nickel transducers, each with plan dimensions of about 7 by 3 in., and spaced 3 in. apart so that they have an effective area of about 9 by 7 in. The transducers are covered with a special insulating material to enable them to withstand the action of the hot Grisiron solution, which is made up from compounds supplied by Roto-Finish, Ltd. transducer is fed with alternating current, at a frequency of 22,000 cycles per sec., from the 1½ kW., generator set seen at the left in Fig. 2. The 8-in. square wire mesh baskets, seen in the tank in Fig. 3, will each hold 30 front portions or 18 complete spectacle frames of the plastics material, or 100 complete metal frames.

These baskets are filled at an adjacent bench and are placed initially at the left-hand end of the tank. As the baskets are removed from the right-hand end,

nev

righ

dire

vib

vig

tion

ren

ext

Ins

top

eac

and

the

for

jets

iror

dra

pip

tan

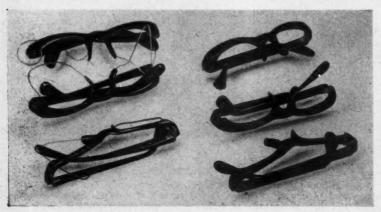


Fig. 1. Examples, before and after treatment, of plastics spectacle frames made by the British American Optical Co., Ltd. These frames are cleaned ultrasonically after final polishing



Fig. 2. The special Schoeller ultrasonic cleaning plant for plastics spectacle frames has a rectangular tank containing a solvent, with two laminated nickel transducers in the base at the deeper end

newly-filled baskets are added at the left. At the right-hand end of the tank, the basket is placed directly on the transducers, and the ultrasonic vibrations generated in the water produce a vigorous scrubbing action which rapidly removes all trace of the polishing compound.

A period of 20 sec, is sufficient for the completion of the treatment and the basket is then removed and placed in the deeper tank at the extreme right-hand end of the cabinet in Fig. 3.

Inside this tank, at the top, there is a pipe, with a projecting piece at each corner of the tank, and in each projection there is a number of jets for cold water. These jets rinse off the Grisiron solution, which drains away through a pipe at the base of the tank, and the frames in

on

to-

n-

a

id.

in.

aboth
atron
ten

ing

ing

ht-

of

kel

out

ave

ns-

ing

a of

rom

ach

t a

the

. 2.

the

s or

stics

are

cent

aced

nand

the

oved

end,

the basket are subsequently dried in an air blast to prevent water marks. It has been estimated that the plant shown, which is tended by a single operator, does the work of 12 people who would other-

wise be engaged in the tedious work of manual cleaning by the methods described earlier.

Another ultrasonic cleaning plant, in a nearby factory of the same company, is employed for the thorough cleaning of spectacle lenses, especially of the two components of bi-focal lenses, prior to assembly. The surfaces of such lenses must be scrupulously clean before they are finally put together, and ultrasonic treatment has so far proved to be the most effective.



Fig. 3. After being cleaned ultrasonically in the tank containing the transducers, the baskets of frames are rinsed under cold water jets in the smaller tank at this end of the Schoeller plant

Gold Star Unit Tooling System

WITH THE GOLD STAR SYSTEM of unit tooling for presses, which is the subject of a patent application and has been infroduced recently by P. & H. Metal Products (Kingston), Ltd., Lower Teddington Road, Hampton Wick, Kingston-on-Thames, Surrey, individual punch and die assemblies are bolted to upper and lower bolsters. Consequently, there are no obstructions at the front or the rear of the tooling area, and thus no limitations are imposed on the width of the work. Moreover, completed parts can be discharged at the rear, as would be required for line production, for example.

The system is intended primarily for use on press brakes, and as may be seen in the typical set-up shown in Fig. 1, the bolsters are incorporated in a unit similar to a conventional die set,

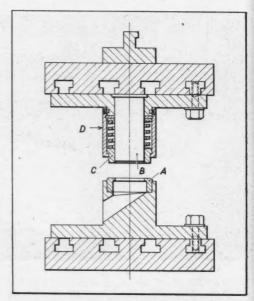


Fig. 2. Sectional elevation showing the punch and die assemblies of a Gold Star type B unit



Fig. 1. With the Gold Star system of unit tooling, standardized punch and die assemblies of two sizes are bolted to the top and bottom bolsters of a special die-set unit, as here shown

which has guide pillars at two diagonally-opposite corners. This set is normally available with an opening of 6, 8, or ft. between the pillars, although other sizes can be supplied, and the overall length is 6 in. greater than this nominal dimension. With die sets having a nominal length of 6 or 8 ft., for example, the overall shut height is 9% in., and for a 10-ft. unit, 10% in. Provision is made for attachment of the bolsters to the ram and bed of the press, but owing to the wide variety of methods employed on various machines for tool holding, the arrangements are designed to suit the lindividual applications.

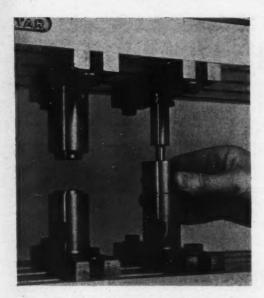


Fig. 3. When setting-up a multiple tooling arrangement, the bottom tools are first positioned with the aid of a template. The top tools are then aligned individually, by means of a centring sleeve

With one commonly employed method, a tenon extends along the top surface of the upper bolster, for

clamping to the ram, and the lower bolster secured in position by means of angle-brackets which are bolted to Tslots along the front and rear of the bed. Four longitudinal slots, which are usually of dovetail section, are provided in the working surface of Three each bolster. stops, for locating the work, are supplied with each die set, one of which may be seen at the left of the tooling in Fig. 1.

llars

opo-

et is

with, or the

ther lied,

ngth this

sion.

3 or

the

s 9%

unit,

is t of

ram

ress, wide

em-

o u s nold-

ents

the

ions.

Standardized piercing units are available in two sizes, and the type A will a c c o m m o d a t e punches and dies for holes of any shape which is enclosed by a circle

of % in. diameter. Shapes which are contained within a circle of 11/2 in. diameter can be pierced with the type B units. Punches and dies are normally made with operating clearance to suit work material between either 10 and 14 s.w.g. or 16 and 24 s.w.g., but can also be supplied to suit special requirements. Referring again to Fig. 1, where one B-type and four A-type units are shown, it will be seen that the associated punch and die assemblies are of similar appearance, each comprising a cylindrical portion and a mounting flange. Slots in the base of this flange, for attaching the assembly to the bolster, provide for considerable adjustment laterally for positioning the unit, and it is stated that a series of units can normally be staggered up to 5 in. about the longitudinal centre line of the tooling area. The sides of the flanges are machined, and the overall width of the unit is 1½ or 4 in., according to size.

TYPICAL PIERCING UNIT

A sectional elevation of a piercing unit of the larger type mounted on the bolsters is shown in Fig. 2. The punch and die holders are Meehanite castings, and a recess at the top of the latter houses the circular die A, the periphery of which is ground to close limits for diameter. A small portion of the die projects above the surface of the holder. It is clamped radially by means of a grub screw, and to facilitate setting up for piercing shapes other than circles, can be located

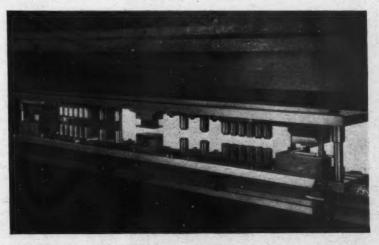


Fig. 4. At the ends of this Gold Star tooling set-up can be seen right-angle notching units which are available. The special tool at the centre provides for piercing five closely-spaced holes

angularly. An inclined passage in the body of the holder provides for discharging the piercings at one side

Shouldered at the upper end, the punch B is located in a counterbored hole in its holder and, since the shank is of a standard diameter, can be replaced for piercing holes of a different size. A self-contained stripper assembly is provided, and incorporates the stripping bush C, which can move axially in the housing sleeve D. This bush is urged downwards by a heavy compression spring. The housing is retained in position by a bayonet fixing, and can be readily removed from the punch holder when it is required to change the bush.

When setting up a number of these standard piercing units, the bottom tools are first positioned with the aid of a sheet metal template, which has holes for locating the projecting portions of the dies. For positioning each punch member in

relation to the associated die, the stripper assembly is removed. The punch is then located with the aid of a simple sleeve, the two concentric bores of which fit closely over the shank of the punch and the periphery of the die. In Fig. 3, the punch for an A-type unit is seen being located in this manner.

Right- and left-hand units for cutting 90-deg. notches up to 4 in. long in each direction are also available, and since they are of self-contained design, with guide pillars, they can be used without the special die-set if desired. Adjustable stops are incorporated for each direction, and where these units are employed at both ends of a tooling set-up, as shown in Fig. 4, no further provision is necessary for locating the work. Special tools can be supplied for operations such as multiple piercing of closely-spaced holes or embossing, and such a tool is seen at the centre of the set-up that is illustrated in this article.

ir

fi

e b a s d s d r F s ii c c

Eclipse Magnetic Strip

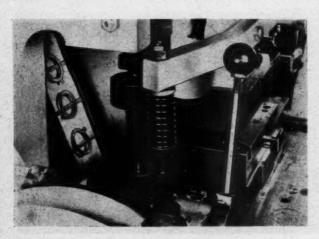
Eclipse magnetic strip, which has been introduced recently by James Neill & Co. (Sheffield), Ltd., Napier Street, Sheffield, 11, is of the by the in. rectangular-section and is composed of plastics and Feroba permanent magnetic powder. Maximum magnetic attraction is obtained at one face of the strip, along which extends a shallow groove to separate areas representing the North

and South poles. It will be appreciated that the attraction is proportional to the length of strip used, and it varies from 3 oz. per in., when the face is in contact with the part being held, to 1.5 oz. per in. when there is a gap of 0.015 in.

The strip can be formed to a radius of 1½ in. at room temperature, the flexibility being increased by heating, and the required length is easily

broken off after the surface has been scored with a knife. It can be drilled, for attachment to a wooden backing piece, for example, and can also be cemented in the required position by means of a number of proprietary adhesives.

Amongst the many uses suggested for the strip, reference may be made to the attachment of short lengths to a conveyor belt, which is employed for elevating small parts at steep angles. Such an arrangement, for transporting work from a blanking press, is shown in the accompanying illustration. It can also be used, for example, as a bracelet for holding small parts prior to assembly, and can be incorporated in lifting pads or gloves. Paint spray masks can be held in position, for which purpose the flexibility of the strip offers advantages, and papers or templates can be clamped to tinplate-faced boards.



Short lengths of Eclipse magnetic strip are here seen attached to a steeply-inclined conveyor belt, for transporting parts from a blanking press

NEWS OF THE INDUSTRY

Hull and East Yorkshire

MACFARLANE THIRSK (ENGINEERS), LTD., Swine Gate, Hessle, makers of component parts for the motor vehicle, aircraft, and hydraulic equipment manufacturing industries, report a continued heavy demand for their services. We are informed that production capacity has recently been increased by the addition of a Wickman 2%-in. 6-spindle automatic.

Hull, are maintaining a high output of jigs, tools, fixtures, gauges, and component parts for aeroengines and hydraulic assemblies. A new factory building, which was recently occupied at the above address (telephone Hull 20274), covers some 7,500 sq. ft. and includes a commercial office block, design and drawing office, production machine shop, fabrication department, fitting and assembly department, jig boring section, and canteen and recreation room. Foundations are at present being prepared for an extension which will provide stores, packing, and garage space. We are informed that the company now undertakes the design of jigs, fixtures, and special tools for customers who do not have the necessary facilities.

Contract machining work of a general nature is being undertaken by a recently-formed associate company, Pylot Mechanical Products, Ltd., in part of the old works at Blundell's Buildings, Hull. The office staff of this company are housed in the new factory at Clarence Street.

THE HUMBER OIL Co., LTD., Marfleet, Hull, makers of the range of Humbrol paint products, advise us that they have recently introduced a new machinery enamel which is available for either spray application (the various coats being sprayed "wet on wet") with an overall drying time of only 30 min., or for brush application, when the drying time is 1 hour.

Another recent development is Humbrol Hi-Glow fluorescent paint which is intended for application to danger areas on machines and in workshops. Lubrication oils are supplied in small or large quantities to special orders, and products of the company also include a 10 per cent sulphurized cutting oil.

J. W. & T. H. Carter, Ltd., 83 Sharp Street, Hull, inform us that they are experiencing increasing calls on their services as contract machinists from a large number of customers engaged in a wide variety of industries.

KINGSTON ENGINEERING Co., LTD., Dansom Lane, Hull, are occupied with the construction of special purpose machinery both to their own designs and to customers' specifications. Other activities include the production of transmission screws in a wide range of sizes, with Acme, square

This pressure vessel head has been produced by G. A. Harvey & Co. (London), Ltd., at their Greenwich works, and was included among their exhibits at the recent Leipzig Fair. Of dished and flanged form, with an inside diameter of 12 ft. 6 in., and a weight of 6½ tons, it was "spun" from 1½-in. thick stainless steel Colclad plate on a Rotarpress machine. It is stated, there are only two such machines in this country



here ling on is can cing

llus-

ined

rith-

the ores

nch inch this deg.

the strip the , to .

ased asily been lled, king be be be by

ested nade ns to oyed teep for aking nying

ding can s or held the lvan-

n be

, for

and buttress-type threads, also of Nitralloy steel extruder screws.

JOHN CHERRY & Sons, Beckside, Beverley, makers of pumps and pumping units, inform us that their works are well occupied with orders from many countries. It may be noted that one recent export order was for 250 pumping sets, for use in the Persian Gulf area.

BECK ENGINEERING Co., Beck Hill, Bridlington, are busy with the production of their range of patent cam-lock transformer valves for customers at home and overseas, and we understand that Poland and Japan are among recent new customers in the export field. Other activities include the production of prototype and special machinery to customers' drawings and specifications, gear cutting for the trade, marine repair work, and cyanide hardening for the trade.

R. SUTCLIFFE.

Drilling Machine for Con-rod Bolts

For drilling two split-pin holes of 0·128-in. diameter, which intersect at right angles, in connecting rod bolts of various types, Leyland Motors, Ltd., Leyland, Lancs., have designed and built the machine shown in the accompanying illustration. It is stated that the output exceeds that of two machines previously employed for this work, that considerably longer drill life is obtained, and that operator fatigue has been reduced.

The 30-in. diameter, 4-station, indexing table is arranged for air-hydraulic operation, and the holes in four bolts are completed at each cycle. Each of the four jigs has four bushes, which are interchangeable to suit bolts of different sizes, and provision is made for pneumatic clamping. Two Archdale hydraulic feed units, each of which drives a 4-spindle head, are mounted side by side. A jig is presented to each head at an angle of 45 deg., and it will be noted that the drills are staggered to suit this arrangement. Coolant is supplied by a Metro-Vick pump.

At the completion of the drilling cycle, the operator starts the indexing movement, and a jig with four drilled bolts is presented at the unloading and loading station. In this position, four airoperated pistons raise the bolts, so that they can readily be grasped and removed. Fresh bolts are then loaded. It will be understood that unloading and loading take place while the drilling cycle is in progress.

British Petroleum Films

Two new films on industrial lubrication were recently shown in London by the British Petroleum Co., Ltd., B.P. House, Ropemaker Street, E.C.2.

Entitled "The Hidden Power," the first film runs for about 25 min., and shows typical lubrication conditions in a number of different industries in various European countries. In the laboratory, it

is explained, many of conditions these are reproduced to assist in development the lubricants with characteristics that are suitable for such duties. film affords some indication of the complexity of the problems of induslubrication and draws attention to the need for new research techniques to keep abreast of industrial developments.

"Service to Industry" is the title of the second film, which throws light on many aspects of the company's lubrication service. The spectrographic analysis of crankcase oil from diesel locomotives in service,



Leyland 4-station indexing machine for drilling split-pin holes in connecting rod bolts

the development of special cutting oils for operations with portable power tools in the aircraft industry, and tests on lubricants for free piston gasifiers are shown. Although the time is only 8 min., this film serves to emphasize the advantages to be gained by arranging for lubrication surveys to be carried out at works by experts. As a result of such surveys, the number of grades of lubricants can be reduced in many instances, with the result that dispensing and storage are simplified.

Copies of the films are available, free on loan, on

application to the above address.

Machine Tool Scholarships

The design scholarship selection board of the Machine Tool Trades Association recently made awards to the 13 candidates listed below. These scholarships, tenable at Manchester College of Science and Technology, cover a 2-year postgraduate course in machine tool design. On account of the strength of competition, the board felt justified in making 13 awards in comparison with the normal 10 per year. It is a condition that candidates must be qualified engineers, already engaged in the industry. The employers, also named, have agreed to release the students for the duration of the course and to provide other assistance.

W. Bielinski, Cincinnati Milling Machines, Ltd.

E. Bill, B.S.A. Tools, Ltd.

P. Cooke, Kendall & Gent, Ltd.

N. Davies, James Archdale & Co., Ltd.

J. Harrison, Heald Machines, Ltd. B. Holgate, William Asquith, Ltd.

T. Maguire, Delapena & Son, Ltd.

G. Marsland, George Richards & Co., Ltd.

H. Mawer, Dean, Smith & Grace, Ltd.

B. Merry, Alfred Herbert, Ltd. E. Reeves, W. E. Sykes, Ltd.

A. Whiteley, George Richards & Co., Ltd.

C. Wyatt, Alfred Herbert, Ltd.

Mr. Robert W. Asquith is chairman of the board, and the other members are Dr. F. Koenigsberger and Prof. Johnson (Manchester College of Science and Technology), Mr. A. P. F. Edwards (of D.S.I.R.), Mr. A. G. Dowding, Mr. S. Radcliffe, Mr. G. W. Wright, Mr. H. O. Barrett (general manager M.T.T.A.) and Mr. G. H. L. Bird (education officer, M.T.T.A.).

Japanese Steel Production Plans

According to a report issued by The Fuji Bank, Japanese steel production, which exceeded 22 million metric tons last year, will continue to increase rapidly. Plans which have been drawn up by the six leading steel producing

companies, responsible for 68 per cent of current output, indicate that an annual capacity of 48 million metric tons for the country will be achieved by 1970. Some doubt is expressed, however, as to whether demand will expand with sufficient rapidity to keep up with such a growth in capacity. In this connection, however, attention is drawn to lack of competition in the main export markets in South East Asia, the immense potential market of mainland China, and the present low domestic consumption per head of population. It is stated that it is hoped to raise the latter, by 1970 or earlier, to the present U.S.A. figure of 960 lb. per person.

Despite the need to import much of the raw material required, the report indicates that product on costs in the Japanese steel industry in 1957-58, although higher than in U.S.A., were equal to those in Germany and England

and appreciably lower than those in France.

New Companies Registered*

Crabtree Engineers (Rochdale), Ltd., Mellor Street Works, Mellor Street, Rochdale. Registered January 20, 1961. To take over the business of light engineers and plastic moulders carried on at Rochdale by S. H. Crabtree, etc. Nom. cap.: £10,000 in £1 shares. Directors: S. H. Crabtree, Mrs. O. L. L. Crabtree, and G. T. Etheridge.

VOKES-TELFORD, LTD., 249 London Road, Hazel Grove, Cheshire. Registered March 9, 1961. To carry on the business of dealers in and manufacturers of machine tools, engineers' small tools, etc. Nom. cap.: £1,000 in £1 shares. Directors: Mercine Taboada and Harvid P. Chaffe.

HOLLAND REPETITION Co., LTD., 36 Mackenzie Street, Slough, Bucks. Registered March 13, 1961. To take over the business of precision engineers carried on as "Holland Repetition" at 6 Hanworth Road, Hounslow, etc. Nom. cap.; £1,000 in £1 shares. Permanent directors: E. Holland and Mrs. E. Holland.

BILLMAC TOOL & ENGINEERING Co., LTD., 168 Upminster Road, Upminster. Registered March 13, 1961. Nom. cap.: £2,000 in £1 shares. Directors: Wm. McEwen and Lilian E. M. McEwen.

Schuler Presses, Ltd. Registered March 14, 1961. To carry on the business of importers and exporters of presses, machine and other tools, etc. Nom. cap. £100,000 in £1 shares. Directors to be appointed by subscribers. Subscribers: E. M. J. Edwards, 25 Stockfield Road, London, S.W.16, and P. G. May, 19 Burfield Road, Eastwood, Leigh-on-Sea.

*From the lists compiled by Jordan & Sons, Ltd., Company Registration Agents, 116-118 Chancery Lane, London, W.C.s.

British Trade Fairs in Mexico

The two British Trade Fairs which were to have been held in Mexico City in September to October and November this year (see MACHINERY, 97/1153—16/11/60) have been cancelled and instead there will be one Fair from February 16 to March 4, 1962. This event will be larger and will cover all the trade categories of both the original fairs.

were eum .2. runs ation

e is

oles

n of

ter-

pro-

Cwo

ives

jig

leg.,

d to

y a

the

jig

oad-

air-

can

are

oad-

ycle

es in ry, it y of are st in

table The dicaity of

and the earch e e p

econd light of the cation ectro-

erankdiesel ervice,

Industrial Notes

WODEN TOOLS, LTD.—The address of this company is now Bernard Road, Sheffield, 2 (telephone, Sheffield 24070: telegraphic address Wodentool, Sheffield 2).

THE ADDISON TOOL Co. (NORTHERN), LTD. The address of this company is now Jubilee Mill, Heywood Street, Waterhead, Oldham. The telephone number [Oldham (Main) 9324] has not been changed.

BRITISH INSULATED CALLENDER'S CABLES, LTD., 21 Bloomsbury Street, London, W.C.1, are now acting as distributors to the electrical industry in Great Britain and Northern Ireland of fibre-reinforced resin materials made by Thermotank Plastic Engineering, Ltd., Chapelhall, Lanarkshire.

THE IRON AND STEEL INSTITUTE, 4 Grosvenor Gardens, London, S.W.1.—The annual general meeting will be held at the Institution of Mechanical Engineers, 1 Birdcage Walk, S.W.1, on May 3 and 4. There will be four technical sessions, one devoted to oxygen in steelmaking, and three to the use of computers in the iron and steel industry.

BIRFIELD, LTD., 20 Hill Street, London, W.1, state that the voluntary liquidation of Bodmin Tools, Ltd. (formerly Birfield Tools, Ltd.) is entirely a matter of internal reorganization and no way affects the activities of the present Birfield Tools, Ltd., which will continue to trade from the new factory at Old Bromford Lane, Stechford, Birmingham.

The Swedish Trade Fair will be held this year in Göteborg from May 6 to 14. A wide range of exhibits will include machine tools, pneumatic tools, hand tools and instruments, and workshop equipment. Full particulars can be obtained from the representatives in Great Britain, John E. Buck & Co., Ltd., 47 Brewer Street, Piccadilly, London, W.1.

A ONE-DAY CONFERENCE ON MATERIALS HANDLING with the title "handling for profit" is being organized by the Willesden and Hendon Local Productivity Association. It will be held at Willesden Technical College, Denzil Road, London, N.W.2, on April 12, and full particulars can be obtained from Mr. G. R. Lutner, S. Smith & Sons (England), Ltd., Waterloo Road, N.W.2.

CHRYSLER AIRTEMP, LTD., is the title of a new company which has been formed by Chrysler International to market in the United Kingdom Airtemp refrigeration, air-conditioning, and heating equipment, and Chrysler marine and industrial engines. The company will operate from the Kew, Surrey, factory where Dodge Brothers (Britain), Ltd., produce British Dodge commercial vehicles.

L. LIPTON, LTD., Phoenix Works, Lamprell Street, London, E.3, offer a fork-lift truck hire service. Trucks with capacities from 10 cwt. to 7 tons are available, with lifts up to 18 ft., and for petrol, diesel, electric, or L.P. gas operation. If required Autostak height preselector equipment can be fitted, and provision is made for full servicing and maintenance.

ESSAY CONTEST FOR COMMONWEALTH TECHNICAL TRAIN-ING WEEK.—Production-Engineering, Ltd., 12 Grosvenor Place, London, S.W.1, are arranging an essay contest for

British apprentices in connection with the forthcoming Commonwealth Technical Training Week. The subject will be "Layout and Design of the Modern Engineering Factory, and full particulars can be obtained from the above address. SC

ti

d

o c T b

inIvhfit

NEWMAN INDUSTRIES, LTD., Yate, Bristol, have been invited by several leading Israeli engineering companies to co-operate in the establishment of a factory at Tel Aviv for the manufacture of Newman electric motors under licence. It is proposed that the company should supply the necessary machinery, drawings, and technical information.

RUBERY OWEN PRESS BRAKE GUARDS.—As previously reported, Rubery Owen & Co., Ltd., Darlaston, are discontinuing the production of press brake guards. It is now announced that, as from April 30, manufacture and servicing of these guards will be undertaken by Boucher & Co., Ltd., Pike Mills, New Road, Kidderminster, and they will be marketed under the name of that company.

NEWMAN, HENDER & Co., LTD., Woodchester, nr. Stroud, Glos., are now producing Newman-Velan valves, under licence from Canada. Forged steel valves, of bonnetless design, which are being made in gate and globe types, can be tested and fully serviced while still connected to the pipe-line. Apart from this facility, it is stated, the valves incorporate features which reduce the need for maintenance.

THE BIRMINGHAM TOOL & GAUGE Co., LTD., Soho Hill, Handsworth, Birmingham, 19, have signed an exclusive agreement with Madison Industries, Inc., Providence, R.I., U.S.A., for the manufacture and distribution of their complete range of special tooling. The range includes trepanning, boring and reaming tools, automatic recessing tools, gun drills, boring bars, and Microller burnishing tools.

EXPERT INDUSTRIAL CONTROLS, LTD., Lount Works, Ashby-de-la-Zouch, Leics., and R. B. Denison Manufacturing Co., Bedford, Ohio, U.S.A., have entered into an agreement whereby the former company will produce in this country the complete Loxswitch range of heavy-duty and precision limit switches. It is stated that these switches have a wide field of application, including, for example, various types of machine tools and handling equipment.

A Post-graduate Course in Welding Technology has been arranged by the Ministry of Education in response to representations by the Institute of Welding and the British Welding Research Association. It will be held at the College of Aeronautics, Cranfield, Bletchley, Bucks. This one-year course will start in the next autumn term (October 9). Further particulars and forms of application can be obtained from The Warden, at the above address.

E.M.I. ELECTRONICS, LTD., Hayes, Middlesex, have supplied an Emidee 1100 computer to the British Motor Corporation. This computer, which is the second that the company has purchased from E.M.I., is now installed in the Longbridge factory. It will handle sales invoicing, sales

accounting, receipt and analysis of orders, production schedules, sales statistics, and stock analysis, and is stated to be capable of performing nearly 500,000 calculations per min.

ng

ct

ng

ne

en

iv

er

dy

a-

is-

nd

&

ley

nr.

es.

of

be

ed

he

in-

ill,

ive

ce.

eir

des

ing

ing

ks.

ac-

an

in

utv

hes

ple,

OGY

nse

the

at

cks.

erm

tion

ess.

ave

otor

the

the

ales

Corrosion Prevention Exhibition.—A special exhibition concerned with metallic corrosion and its prevention is now open to the public at The Science Museum, South Kensington, London, S.W.7, and will continue until April 22 (10.00 a.m. to 6.00 p.m., on weekdays, and 2.30 to 6.00 p.m. on Sundays). The collection of exhibits was assembled by the Corrosion Group of the Society of Chemical Industry to mark the 1st International Congress on Metallic Corrosion which will be held in London from April 10 to 14.

PRATT PENSIONS SCHEME.—A pension assurance plan has been prepared by Noble Lowndes Pension Service for employees of F. Pratt & Co., Ltd., Halifax, and the subsidiary companies. Those who become members will be contracted out of the State Graduated Scheme. Male employees between the ages of 21 and 64 are eligible. They will pay 2s. 6d. per week and will receive a pension benefit of £3 per annum for each year of pensionable service, in addition to the basic National Insurance pension. There will also be a death benefit of £500 if an employee dies before reaching the normal pension age of 65.

An Exhibition of Instruments and Controls for industry, education, and research, organized by A. M. Lock & Co., Ltd., Newborough Road, Shirley, Solihull, will be held at the Central Y.M.C.A., Snow Hill, Birmingham, 4, starting at 2.0 p.m. on April 25. It will then be open from 10.0 a.m. to 7.0 p.m. daily until April 28. More than 20 companies will participate and it is stated that a number of new instruments will be on view. During the period of the exhibition a series of lectures will be given. Admission will be by trade card or ticket obtainable from A. M. Lock & Co., Ltd., at the above address.

An International Industrial Finishes Exhibition and Convention will be held at Earls Court, London, from May 8 to 11. Many leading companies in this field will participate and it is stated that the stands will occupy an area of 27,000 sq. ft. Exhibits will be concerned, for example, with metal pre-treatments, paints and their applications, electro-plating, galvanizing, metal colouring, anodizing, plastics covering, vitreous enamelling, shotblasting, vacuum deposition, and intrumentation. At the convention, 16 papers will be presented on various aspects of finishing. Full particulars can be obtained from Scientific Surveys, Ltd., 97 Old Brompton Road, London, S.W.7.

Coming Events

INSTITUTION OF PLANT ENGINEERS.—Manchester Branch. April 11, at 7.15 p.m., at the Manchester Literary and Philosophical Society's Rooms, George Street, Piccadilly, Manchester; lecture on "Welding," by Dr. F. Koenigsberger. North East Branch. April 13, at 7 p.m., at Roadway House, Oxford Street, Newcastle-upon-Tyne, 1; lecture on "Modern Welding Processes," by J. A. Lucey.

INSTITUTION OF MECHANICAL ENGINEERS.—Western Branch. April 11, at 7 p.m., at the Engineering Laboratories,

University of Bristol, University Walk, Bristol; lecture on "The Potentialities of Accurate Control and Measurement in Engineering Manufacture," by Professor J. Loxham.

THE PLASTICS INSTITUTE.—London and District Section-April 11, at 6.30 p.m., at the Wellcome Building, Euston Road, N.W.1; lecture on "Some Recent Developments in Reinforced Plastics," by T. P. R. Lant.

Institution of Production Engineers.—Liverpool Section. April 12, at 7.30 p.m., at The Exchange Hotel, Tithebarn Street, Liverpool, 1; lecture on "New Materials in Industry 'Plastics,'" by E. M. Elliott. South Essex Section. April 12, at 7.30 p.m., at the Ilford Conservative Club, 42 High Road, Ilford; lecture on "Chemical and Electrolytic Surface Finishes," by D. Read.

THE INSTITUTE OF METAL FINISHING.—London Branch. April 17, at 6.15 p.m., at the Northampton College of Technology, St. John Street, London, E.C.1; lecture on "Plating of Zinc-base Die Castings," by J. Edwards.

MACHINERY'S Annual Buyers' Guide

Extending to 1,190 pages, the 32nd (1961) edition of this directory lists the names, addresses, and products of more than 4,500 suppliers of equipment and materials for use in engineering factories. Recently-introduced headings are concerned, for instance, with automatic control systems for machine tools; tool lapping machines for producing convex radii on diamonds; electrolytic equipment for surface and tool grinding; electrolytic polishing; electrostatic paint spraying plant; spark deposition and spark eroding; and ultrasonic equipment for a variety of operations. All makers of machine tools in Great Britain are listed, as well as the British agents for machines by leading overseas builders.

In addition to the new Russian-English technical translation of approximately 1,000 terms, which was introduced last year, the foreign glossary section now includes an entirely new Spanish-English translation. There are lists of foreign machine tool makers' associations, professional and scientific institutions, research organizations, advice bureaux, and trade associations.

Copies are available, price 12s. 6d., post free, from the Book Department, Machinery Publishing Co., Ltd., National House, 21 West Street, Brighton, 1, Sussex.

Machine Tool Orders

Estimated net new orders for machine tools in December last were valued at £10,227,000, of which £3,080,000 was for export. The December figure brought the total of orders for the year to more than £140 million.

Deliveries during the month totalled £8,552,000, including £2,261,000 for export. For the fourth quarter of 1960, deliveries were 21 per cent higher than in the corresponding period of 1959, and for the year as a whole, the increase was 19 per cent.

Orders in hand at the end of the month are estimated to have totalled £105,382,000, of which £23,753,000 was for export. The corresponding figure at the end of December, 1959, was £55,891,000.

Trade Publications

INTERNATIONAL ENGINEERING CONCESSIONAIRES, LTD., 39 Parliament Street, Westminster, London, S.W.1. Leaflet describing the IEC-Sieger electronic gas detector which is stated to be sensitive to all inflammable gases.

BROOKS & WALKER, LTD., 47 Great Eastern Street, London, E.C.2.—Leaflet describing a 6-in. universal vernier caliper gauge which has recently been added to the PAV range of precision instruments, for which they are sole agents in this country.

A.E.W., Ltd., Imperial Works, High Street, Edgware, Middlesex. Catalogue describing some of industrial electric ovens and furnaces from the company's standard ranges. Ovens of various forms can be supplied for temperatures up to 750 deg. C. Furnaces include types H and L, also conveyor installations, vertical muffles, and soldering iron heaters.

SARO PRODUCTS, LTD., Folly Works, Whippingham, East Cowes, Isle of Wight. Brochure concerned with Sarrac rigid thermoplastic sheet which can be supplied in sizes up to 100 by 48 in. and thicknesses from 0.02 to 0.18 in. The material can be thermoformed and is claimed to be suitable, for example, for battery trays and fittings for motor vehicles, also for guards, housings, linings, office machine components, casings, and covers.

British Central Electrical Co., Ltd., 6 & 8 Rosebery Avenue, London, E.C.1. Leaflet describing the Briticent 4-way, 13-amp., unbreakable, fused, shuttered, socket outlet. Made from hard rubber or neoprene it is claimed that this unit remains undamaged even if run over by a heavy vehicle. Four plugs can be connected to the unit, which may be used, for example, as an extension lead for portable tools or hand-lamps.

STENOR, LTD., Richmond, Surrey. Illustrated folder concerned with the company's Weldbelt outfit for the repair of rubber and P.V.C. belts. With this portable outfit, repairs to conveyor belts can be rapidly carried out in situ, and complete splices may be made if necessary. It may also be used for splicing new belts, repairing transmission belts, and repairing cable insulation and tarpaulins.

Johnson Matthey & Co., Ltd., 73-83 Hatton Garden, London, E.C.1. New 30-page edition of the firm's publication 1302 "Electrical Contacts," which provides comprehensive information on materials and designs for contacts for electrical and electronic equipment. The properties of JMC contact materials are described, also details of the JMC ranges of standard contacts. Sections on electro-deposited contact surfaces, light-duty slip rings, and contact springs are included.

THOS. W. WARD, LTD., Albion Works, Sheffield.—Well-produced, 16-page brochure concerned with the activities of the firm's industrial plant department. Reference is made to horizontal, vertical, and packaged boilers; welded and sectional tanks and pressure vessels; ducting and pipework; metal scaffolding; and miscellaneous fabrications. Attention is also drawn to the services offered by two of the company's subsidiaries, Dick's Asbestos & Insulating Co., Ltd., and Anchor Insulating Co., Ltd.

Books Received

PLATING ZINC ALLOY DIE CASTINGS—AN ATLAS OF PROCESS DEFECTS. The British Non-ferrous Metals Research Association, Euston Street, London, N.W.1. Price 15s.

Issued as Development Report D.64, this publication effectively illustrates typical defects in plated surfaces as they appear when viewed through a small hand lens. In connection with each type of defect, notes are included on "cause" and "remedy."

THE AUSTRALIAN FERROUS FORGING INDUSTRY. Commonwealth of Australia, Industries Division, Department of Trade, Canberra. 32 pp.

It is pointed out in this informative publication that some 125,000 tons of ferrous forgings, to the value of £A23 million, are now produced annually in Australia. More than 170 firms are engaged in the industry, and they provide employment for 5,000 people. Following introductory and historical notes, sections are devoted to the structure of the industry, production, the market, labour, materials, investment, and general comments. An appendix gives a list of forging establishments, with brief notes on the principal forging activity of each.

BRITISH LOCOMOTIVES. The Locomotive and Allied Manufacturers' Association of Great Britain, Locomotive House, Buckingham Gate, London, S.W.1. 88 pp. [Price 15s.]

Including a large number of illustrations, many of which are in full colour, this well-presented book is concerned with the products and achievements of the British locomotive industry. There are seven chapters with the following titles: British Railways modernization; modern motive power; the evolution of the British locomotive industry; member firms of L.A.M.A.; railway modernization overseas; locomotives in British industry; and "looking ahead."

Scot Urquhart, Ltd.

The alphabetical classification of Scot Urquhart, Ltd., 373a Earlsfield Road, London, S.W.18, in the 1961 edition of MACHINERY's Annual Buyers' Guide is incorrect and we are asked to point out that the company should appear as Urquhart, Ltd., Scot.

Promotion of Economic Growth

(Continued from page 751)

comparative slowness of our economic expansion is more easily understood. Evidently the matter is one that demands the most careful consideration, and if it is found that the contentions are justified some early action must be taken to redress the situation. If the particular solution suggested is not regarded as acceptable, then some alternative must be sought which would "reduce the cost of the capital intensive activity in this country but increase the cost of labour intensive activity."

5/4/61

New Appointments

The following new appointments have been announced:—
MR. J. A. FORD, home sales manager of Renold Chains,
Ltd., Renold House, Wythenshawe, Manchester, as sales
director of Renold Chains (Sales) Australia Pty., Ltd. He

will leave for Australia in June, and will be succeeded by Mr. F. T. STANFORD.

MR. J. CARLE as managing director of George Richards & Co., Ltd., Altrincham, one of the machine tool companies in the Staveley Group. A former works director of Tilghman's, Ltd., also a member of the Staveley Group, Mr. Carle became a director of George Richards in January, 1958, and deputy managing director the following December. He holds directorships in a number of the companies in the group.

Mr. John Roberts as Midland Area representative for Weldcraft Ltd., Slough, a member company of the



Mr. J. Carle

G. D. Peters Group. He was formerly with W. Sapcoat & Son, Ltd., Birmingham.

Scrap Metals

MIDLANDS.—There is a firm demand from local steel-works for deliveries of good quality basic heavy steel scrap. Allocations for 0.04 sulphur and phosphorus heavy steel scrap in the form of bales and/or constructional steel scrap are limited, and merchants are completing their deliveries of this higher priced scrap by Tuesday or Wednesday each week. Larger allocations could certainly be met without difficulty should the steelworks require more of this better quality scrap.

Foundries buying short heavy steel scrap of the low sulphur and phosphorus types have reduced intakes on account of improvements in stocks. Ordinary short heavy steel from local yards meets the requirements of foundries

which are buying No. 2 quality scrap.

Steel turnings are being cleared from local factories, but merchants are not under pressure to improve supplies to blast furnaces. Acceptances of chipped turnings are limited and bushy turnings can only be forwarded in quantity to markets in other areas, where prices f.o.r. the Midlands are comparatively low. Pressing scrap of all grades is cleared to local yards, but prices for light iron and destructor scrap have fallen because fewer markets are open for No. 5 bales and/or hydraulically compressed destructor scrap.

High-speed steel scrap prices are still uncertain, and quotations for parcels on offer are on a prompt acceptance

Cast iron scrap supplies are better and foundries are reducing prices as their stock positions improve.

Oversize cast material and steel for processing are fetching good prices, delivered yards.

MACHINERY'S ENQUIRY BUREAU

For many years Machinery has provided an enquiry service not only for subscribers and advertisers but for all engineers in need of such information as the names of makers—or their agents—of machines or equipment for performing particular operations, suppliers of various classes of material, firms with facilities for undertaking certain types of work, owners of trade names, and agents for foreign machine builders. If you have such a problem write (Machinery, Enquiry Bureau, Clifton House, 83-117 Euston Road, London, N.W.1) or telephone (Euston 8441, 2 lines). This service is, of course, entirely free.

The Price of a Subscription to MACHINERY is 52 Shillings per annum, post free, to any part of the world.

Subscribers are not bound for any definite period of subscription. We send MACHINERY, post free, each week until told to stop. Subscribers can pay yearly, half-yearly, or quarterly, pro rate. (Cash with order.)

To MACHINERY, National House, 21 West Street, Brighton 1.

Please send me/us MACHINERY every week until I/we tell you to stop, for which I/we enclose remittance of 52 Shillings per annum or pro rata

Vame					•						•			•					•					•			•	•			•		0.0		۰
Addre	88																																		
	• •	• •																						0	0										
Posit	tion	1.																																	
• Firm	١.		• •																																
					-	·F	01	01	m	-	ni	ail	ir	g	I	0	CC	E	ds	1	0E	d	y.												
MAG													d	b	y	8	i	18	įl		CI	P	oi	81		01		81	ıě	18	CF	ij	06	ie	m

MANUSCRIPTS FOR BOOKS covering all branches of engineering production will receive careful consideration and should be sent to the Manager, Book Dept., MACHINERY, National House, 21 West Street, Brighton, 1.

CONDITIONS OF SALE AND SUPPLY.—MACHINERY is sold subject to the following conditions

That it shall not, without the written consent of the publishers first given, be lent, resold, hired out or otherwise disposed of by way of trade except at the full retail price of 1s. 3d. and, that it shall not be lent, resold, hired out or otherwise disposed of in a mutilated condition or in any unauthorised cover by way of trade; or affixed to or as part of any publication or advertising literary or pictorial matter whatseever.

or ch ion

ens. ded

t of

hat of lia. hey

the our, enotes

lied tive pp.

with tive ving tive try;

king

Ltd., ition

pear

on is er is tion, ified the ed is

ative st of but

BRITISH MACHINE TOOL

Exports of New Machine Tools

IMI

and

Qua sity Cw and No

> 56 (3 216 (7 56 (4 97! (22 300 (1) 720 (1)

5,1

ar

	Bar Chuc Auton	king	Vert Bor Mach	ing	Bor	her ring hines	Dril Mack	ling		cutting hines	Grind Laps and H Mach	oning	Capsta Tur Lat	ret		her
Countries	Quantity. Cwt. and No.	Value £	Quantity. Cwt. and No.	Value £	Quantity. Cwt. and No.	Value £	Quantity. Cws. and No.	Value £.	Quantity. Cwt. and No.	Value £	Quantity. Cwt. and No.	Value £	Quantity. Cwt. and No.	Value £	Quantity. Cwt. and No.	Value £
Commonwealth South Africa	-	-	94	8,600	67 (1) 2,177	5,476 121,508	218 (50) 340	5,354 8,995	600	21,252	215 (22) 459	8,360 18,551	168 (8) 1,343	7,468 55,750	670 (79) 722	23,24
Pakistan	-	_	(2)	-	(2)	-	(9) 9 (3)	368	-	-	(22) 37 (4)	2,123	(24)	-	(7) 216 (6)	6,58
Australia :	49 (2)	2,948	135	9,377	591 (2) 7	17,097	(31)	27,090	-		2,256	49,811	854 (24) 122	35,889	(70)	50,19
New Zealand Canada	-	_	(1)	931	(1)	397	(20) 64	5,864	(1)	2,416	75 (14) 157	2,449 5,438	(6)	3,228	734 (37) 468	28,87
Miscellaneous	-	-	-	-	(1) 167 (6)	1,995	(5) 115 (39)	3,784	-	-	(14) 183 (23)	6,216	2 (1)	74	(14) 476 (19)	12,50
Foreign Soviet Union	11/2	_	_		_	_	_	_	-	_	4	_	-	_	_	_
Sweden		-	-	-	80	5,027	58	1,261	-	-	46 (3)	716	400 (10)	17,383	650 (17)	31,0
Norway		7.648	-	-	-	-	141	4,267		-	(1)	257	(1)	13,781	(5) 53	5
Western Germany	(1)	7,040	_		1	_	(5)	1,013	1,000	48,150	38	1,667	(5) 154	6,620	(15)	56,9
Netherlands	-	-	-	-	-	-	(30) 128 (8)	3,049	(1)	-	(5) 134 (17)	6,519	190	2,587	(65) 263 (19)	9,2
Belgium	1	-	95 (I)	6,583	-	-	161 (3) 71	3,090	86 (2)	6,776	(10)	5,318	108	1,105	(2)	. 8
Switzerland	(2)	15,011	=	_	_	_	(1) 152	1,368	28	938	(8) 89	7,472	(6) 103	14,244	(4) 25	8,1
Spain		-	-	_	-	-	(5)	-	(1)	-	(4)		(4)		(2)	-
Italy	417	27,895	-	-	50	4,543	48	2,045	-	-	434	15,182	223	9,544	160	9,6
U.S. America	-	_	(1)	520	040	90	(3) 358 (8) 333 (46)	9,447 8,089	-	-	343 (16) 982 (59)	15,359 46,926	225 (8) 854 (18)	15,053 43,959	4\$5 (23) 1,456 (52)	13,5
Total	1,021	53,502	350	26,011	3,144	156,197	3,554	92,729	1,758	79,532	5,843	195,497	5,368	232,437	9,324 (437)	332

Total exports of reconditioned machine tools:—Quantity: No., 129; Weight, 7,482 cwt.; Value, £60,926. Total exports of imported machine tools:—Quantity: Weight, 536 cwt.; Value, £36,207.

Imports of New Machine Tools

Country	Bar and Chucking Automatics		Vertical Boring Machines		Other Boring Machines		Drilling Machines		Gear-cutting Machines		Grinding, Lapping and Honing Machines		Capstan and Turret Lathes		Other Lathes	
Origin	Quantity. Cwt. and No.	Value £	Quantity. Cwt. and No.	Value £	Quantity. Cwt. and No.	Value £	Quantity. Cwt. and No.	Value £	Quantity. Cwt. and No.	Value £	Quantity. Cwt. and No.	Value £	Quantity. Cwt. and No.	Value £	Quantity. Cwt. and No.	Value £
Sweden	(1) 169 (8)	4,263 - 17,872 135,279	215 (I) 97 (2) 26 (I) 368	14,712 — 10,143 2,850 15,617	200 (1) 765 (5) — 7 (1) 1,383	6,202 32,458 — — 652 46,518	26 (2) 210 (25) 52 (7) — (2) 113 (3)	509 14,679 1,898 177 11,550	125 (6) — 29 (4) 858 (7) 17	8,796 - 3,821 52,857	789 (13) 1,600 (53) 14 (2) 283 (25) 2,713 (30) 1,403	41,968 92,417 899 25,278 247,285 66,193	754 (22) — 367 (5) —	53,121 — 32,049 — 14,233	79 (1) 945 (26) 274 (6) 728 (27) 2,314 (22) 589	3,350 40,785 15,100 57,463 134,05 21,975
Total	2,903	157,414	(5) 706 (9)	43,322	(8) 2,355 (15)	85,830	(1) 402 (40)	28,913	(1) 1,029 (18)	66,912	6,802 (171)	474,040	(12) 1,883 (39)	99,403	(20) 4,929 (102)	272,7

Total imports of reconditioned machine tools:—Quantity: No., 80; Weight, 8,710 cwt.; Value, £111,151.

IMPORTS AND EXPORTS (Classified)

and Parts during December, 1960

OOL

Cools

23,243 19,318 6,586 50,198 28,870 14,231 12,587

31,066 565 2,034 56,940 9,235 809 8,117 1,748 9,614 13,595 43,971

Tools

Value £

3,350 40,785 15,100 57,463 134,059 21,975 272,732

Milli		Pres	ses	Sheet-r Work Machi	ing	Sawi Machi	ng	Screwin Threa Mach	ding	Shapin Slott Mach	g and	Unit Tr Mach and H	ines	Oth		Machin Par		To	al
Quantity. Cwt. and No.	Value £	Quantity. Cwt. and No.	Value £	Quantity. Cwt. and No.	Value £	Quantity. Cwt. and No.	Value £	Quantity. Cwt. and No.	Value £	Quantity. Cwt. and No.	Value £	Quantity. Cwt. and No.	Value £	Quantity. Cwt. and No.	Value £	Quantity. Cwt.	Value £	Quantity. Cwt. and No.	Value £
56 (3) 216 (7) 58 (4) 975 (23) 302 (17) 720 (8) 139 (5)	2,077 9,980 2,915 42,102 14,504 41,110 6,587	421 (11) 400 (6) 29 (2) 919 (8) 389 (27) —	9,038 14,932 613 18,902 7,542 — 3,062	(2) 375 (5) 491 (19) 340 (35) 660 (4) 78 (77)	35,283 13,576 10,514 8,558 12,644 1,678	82 (11) 25 (2) - 689 (9) 49 (7) 32 (4) 10 (2)	2,265 1,063 — 16,776 1,208 635 326	(1) 17 (10) 369 (12) - - 9 (1)	103 1,184 — 21,694 — 348	2 (3) 617 (8) 8 (1) 444 (14) 89 (4) ———————————————————————————————————	319 24,583 202 9,346 1,710 2,568	-		582 (36) 214 (13) 17 (2) 1,251 (15) 31 (4) 9 (6) 53 (16)	26,142 12,513 922 42,940 969 372 2,429	1,312 748 24 2,292 240 63 288	28,599 1,250 98,708 11,320	(229)	198,012 339,152 14,979 453,392 89,966 83,566 58,480
-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	_
47 (1) 20	2,343	_	128	440	11,665	_	-	75 (3)	6,410	-	-	-	-	160	8,594	169	7,946 5,294	2,125 (43) 138	92,41
(1)	253	(1)		_		_	-	-	-	-	_	_	-	(3)	609	27	2,985	672	31,57
351	17,404	410	17,926	346	16,494	-	-	41	3,499	-	-	-	-	320	11,943	130	12,473	(28) 4,325	194,12
(3) 362 (6) 186	18,243	(34)	67	(13) 8 (3) 230	6,140	25	300	(2) 20 (1)	1,483	103 (2) 29	944	=	=	(3) 100 (16) 4	5,710	114	8,018	(159) 1,425 (75) 1,151	56,05 35,42
(2) 556 (3) 225	17,447	408	12,465	(1)	-	(5) 7 (1)	369	32 (1) 38	2,576	(1) 70 (4)	1,316	-	-	(1) 55 (10)	3,026	220	16,168	(29) 2,502 (43)	99,5
225 (4) 81	3,425	(1)	5,670	5	375	-	-	38	3,272	12	409		=	(1)	4,082	-3.	36,516	1,661 (23) 320	79,8
(2)	-	(1)	2,000	126	9,701	-	-	-	-	(1)	-	-	-	271	20,500		10,350	1,841	111,3
31 (1) 806 (12)	860 37,736	(20) - 1,922 (17)	53,927	(6) 330 (125)	6,283	7 (1) 54 (7)	1,469	49 (1) 211 (9)	3,004 22,243	(3)	6,421 9,472		225	(14) 125 (9) 2,762 (160)	92,75		11,300 35,433	(65) 1,957 (72) 11,061 (532)	88,1 402,
5,133	234,824	5,295	155,013	4,548	133,109	980	25,298	861	65,816	1,948	57,856	2 (1)	225	6,051		1 7,931	364,23	63,111	2,450

Figures in parentheses denote number of machines. * Not including machine tool cutting parts.

and Parts during December, 1960

Mill		Pres	sses	Sheet- Wor Mach	king	Saw Mach		Screwi Three Mach	ding	Plan Shapin Slott Mach	g and	Unit To Mach and H	nines	Otl Mach		Machin Par		Te	otal
Quantity. Cwt. and No.	Value £	Quantity. Cwt. and No.	Value £	Quantity. Cwt. and No.	Value £	Quantity. Cwt. and No.	Value £	Quantity. Cwt. and No.	Value £	Quantity. Cwt. and No.	Value £	Quantity. Cwt. and No.	Value €	Quantity. Cwt. and No.	Value £	Quantity. Cwt.	Value £	Quantity. Cwt. and No.	Value £
279 (5) 1,409 (34) 324	13,177 78,541	(1) 2,848 (25)	54 79,205	71 (4) 939 (33)	1,316 34,670	16 (2) 217 (18)	456 10,497	151 (22)	- 8,522	(10)	863	-	-	6 (3) 1,591 (74)	249 92,852	71 808	4,832 61,165	1,551 (42) 12,659 (345)	72,976 626,683
(8)	15,278 51,770	(25) 39 (2) 41	1,879 3,116	(33) 500 (1) 8	13,513 454	1. 1.	-	-	_	17 (1)	1,328	=	_	37 (23) 136 (33)	5,376 16,599	249	17,324	1,489 (49) 3,144 (118)	71,267 238,764
(9) 973 (14) 1,043 (27)	61,060 32,482	(1) 262 (14) 439 (15)	18,143 8,201	188 (14) 648 (15)	36,393 18,878	199 (23)	5,044	205 (12) 8 (1)	1,800	451 (17)	11,130	-	-	2,358 (25) 36 (8)	176,462	2,156 521	213,039 18,344	(116) 14,825 (155) 7,868 (201)	1,111,66 264,174
5,211	252,308	-	110,598	-	105,224	432 (43)	15,997	364 (35)	32,358	481 (28)	13,321	-	-	4,164 (166)	293,759	3,891	333,398	-	2,385,52

Figures in parentheses denote number of machines. * Not including machine tool cutting parts.

Machine Tool Share Market

A high level of activity was maintained in stock markets during the period under review with interest concentrated mainly on industrial equities, and although unsettled conditions developed towards the close, the underlying tone remained firm.

The gilt-edged section, after remaining quietly steady, gradually reacted, and at the end, lower levels were recorded for British Funds and similar fixed interest stocks.

Commercial and industrial share markets were buoyant and displayed an upward trend for the most part, but became irregular, with final prices below the best. Never-

theless good features were not lacking.

Among machine tool issues, Edgar Allen advanced 3d. to 42s. 9d.; Arnott & Harrison, 1s. to 15s.; Asquith Machine Tool, 7½d. to 11s. 10½d.; Birmingham Small Arms, 1s. 9d. to 35s.; Chas. Churchill, 6d. to 10s. 1½d.; Geo Cohen, 6d. to 14s.; Coventry Gauge & Tool, 1s. to 29s. 10½d.; Craven Bros. (Manchester), 3d. to 11s. 4½d.; Greenwood & Batley, 1s. 6d. to 26s.; Alfred Herbert, 3s. to 70s. 6d.; Newall Engineering, 1s. to 9s. 9d.; Samuel Osborn, 2s. to 52s. 9d.; F. Pratt, 1½d. to 16s. 10½d.; Ambrose Shardlow, 3s. 9d. to 53s. 9d.; Scottish Machine Tool, 3d. to 10s. 3d.; Sheffield Twist Drill, 3d. to 19s. 3d.;

Tap & Die Corporation, 6d. to 15s. 6d.; and Thos. W. Ward, 2s. 6d. to 77s. 6d.

Apri

Personal

MR. E. J. ROUTLY, chairman, MR. A. MURRAY, managing director, MR. W. G. F. WESTBROOKE, and MR. J. CAMPBELL, now constitute the board of The Expert Tool & Case Hardening Co., Ltd., which was recently acquired by The Northern Mercantile & Investment Corporation, Ltd.

MR. Dennis C. May, A.M.Inst.B.E., sales director, has decided to resign from his position with A. Capp & Son, Ltd., Verdict Gauge Works, Thames Road, Crayford, Kent. Mr. May has been with the company for 14 years and his fellow directors express regret at his decision and wishes for his success in his new undertaking.

MR. V. JOBSON (chairman), MR. J. R. FLEMING (vice-chairman), MR. T. W. COOPER (managing director), and MR. E. J. APPLEBY, MR. H. CLARKE, MR. R. H. HARRIS, and MR. H. A. REDSHAW (executive directors) now constitute the board of Qualcast, Ltd., Victory Road, Derby. The main foundries at Derby will in future be operated as a sub-group under a separate management board headed by Mr. A. J. Batterham.

COMPANY		Denom.	Middle Price	COMPANY		Denom.	Middle Price
Abwood Machine Tools, Ltd	Ord	1/-	1/3	Herbert (Alfred), Ltd	Ord	£I	70/6
Allen (Edgar) & Co., Ltd	Ord	£1	42/9	Holroyd (John) & Co., Ltd	"A" Ord	5/-	16/3
	5% Prf	Éi	13 9xd*	1	"B" Ord	5/-	15/6
Arnott & Harrison, Ltd	Ord	41-	15/-	33 33 35	D 014	-1-	.010
Asquith Machine Tool Corp., Ltd	Ord	5/-	11/104	Jones (A. A.) & Shipman, Ltd	Ord	E.L.	47 /6×0
Asquith Fischine 1001 Corp., Ltd	6% Cum. Prf.	6	16/3	ones (A. A.) & Snipman, Ltd	7% Cum. Prf.	5/-	4/9
	.,0		1				10
Birmingham Small Arms Co., Ltd	Ord	10/-	35/-	Kearney & Trecker-C.V.A., Ltd	51% Red.	£I	11/-
	5% Cum.	(1	14/6		Prefd. Ord	13	13/9
11 11 11	"A" Prf.		1.410	Kearns (H. W.) & Co., Ltd	Ord		22/6
	404 Cum	(1	16/6	Kerry's (Gt. Britain), Ltd	Ord.	5/-	11/3
69 80 ***	6% Cum. B" Prf.	2.1	10/0	Macreadys Metal Co., Ltd	Ord.	3/-	16/-
		Stk.	904	Marcin Bros. (Machinery), Ltd	Ord.	3/-	2/6
99 99 99 ***	Dab.	Str.	201	Massey (B. & S.), Ltd	Ord.	5/- 2/- 5/-	
		5/-	31/-	riassey (b. & 5.), Ltd	Ora	3/-	11/6
British Oxygen Co., Ltd		6	20 6	Manuall Publication Co. Ltd.	0-1	01	0.0
2 - 2 - 2 - 1 - 1 - 1 - 1 - 1 - 1 - 1 -	6% Cum. Prf.		7 3	Newall Engineering Co., Ltd	Ord	2/-	9/9
Brooke Tool Manufacturing Co., Ltd.	Ord	5/-		Newman Industries, Ltd	Ord	2/-	5/6
Broom & Wade, Ltd	Ord	5/-	26 9		6% Prf. Ord.	5/-	5/-
	6% Cum. Prf.	61	16 6xd	Noble & Lund, Ltd	Ord	2/-	5/6
Brown (David) Corporation, Ltd	54% Cum. Prf.	(1	16/-	Norton, W. E. (Holdings), Ltd	Ord	2/-	5/-
Buck & Hickman, Ltd	6% Cum. Prf.	£I	17/-	Osborn (Samuel) & Co., Ltd	Ord		52 9
Butler Machine Tool Co., Ltd	Ord	5/-	16/104		54% Cum. Prf.		23 6x
	5% Cum. Prf.	61	14/3	Pratt (F.) & Co., Ltd	Ord	5/-	16/10
		1	1	Sanderson Kayser, Ltd	Ord	10/-	37 /6
Churchill (Charles) & Co., Ltd	Ord	2/-	10/14		64% Cum. Prf.	1	18/-
		(1)	25 1041	Scottish Machine Tool Corporation	Ord	4/-	10/3
Clarkson (Engrs.), Ltd	Ord	5/-	30/-xd	Lta.			
Cohen (George), 600 Group, Ltd	Ord	5/-	141-	Shardlow (Ambrose) & Co., Ltd	Ord	£1	53.9
	44% Cum. Prf.	(1)	13/-	Shaw (John) & Sons, Wolverhamp-	Ord	5/-	17/9
Coventry Gauge & Tool Co., Ltd	Ord		29 104	ton, Ltd.		,	10 10
				Shaffiels Twist Drill & Steel Co., Ltd.	Ord	4/-	19/3
	5% Cum.	(1)	16/3		5% Cum. Prf.	13	13/9
	Red. Prf.			Stedall & Co., Ltd	Ord	5/-	8/9
Craven Bros. (Manchester), Ltd		5/-	11 '44	Sykes (W. E.), Ltd	"B" non-	10/-	26/3
Elliott (B.) & Co., Ltd.			3 44		voting Ord.	101-	20/3
		(1)	12/-	Tap & Die Corporation, Ltd	Ord.	5/-	15/6
99 99	Cum. Prf.	-	121-			Sek.	
Expert Tool & Case Hardening Co.,		2/-	2/74	29 29 29	1961-1977	SEK.	821
	Ord	4/-	4/18	Medicina Lad		10/-	
Ltd.	40/ Cum P.4	(1)	111	Wadkin, Ltd.	Ord	10/-	20/-
Firth Brown Tools, Ltd			11/-	Ward (Thos. W.), Ltd	Ord	. []	77 /6x
Greenwood & Batley, Ltd	Ord	10/-	26/-	***************************************	5% Cum.	£1	14/-
Harper (John) & Co., Ltd		5/-	8/6	***************************************	5% Cum.	13	22/-
49 19		£1	12/14		2nd Pref.		1
	Cum. Prf.	1	1	Willson Lathes, Ltd	Ord	1 1/-	3/4

The Middle Prices given in the list are in several cases nominal prices only and not actual dealing prices. Every effort is made to ensure accuracy, but no liability can be accepted for any error. * Sheffleld price.

\$ Birmingham price.

W.

AY,

ol &

Ltd.

has

Son, ord, ears and riceand RRIS, con-

erby. rated oard

ddle rice

0/6 6/3 5/6

7 /6xd 4/9

1/-

3/9 12/6 1/3 16/-2/6 1/6

9/9 5/6 5/-5/6 5/-52 9 13 6xd 16/101 37/6 18/-10/3

53 /9 17 /9

19/3 13/9 8/9 26/3

15/6

821 20 /-77 /6xd 14 /-

22/-

3/44



"Composine" COMPOUND AND SIMPLE ANGLE SINE TABLES

NEW UNIVERSAL TYPE: MADE TO HINGE FROM EITHER END OF BASE PLATE TO ENABLE ALL COMPOUND ANGLES TO BE OBTAINED

TYPE E.W.U/L. Face Ilin. x 7in. £185 complete with 6in. centres.

SIZES: TYPE E.W.U/L.	111. 71.
Face (T Slotted)	
Base	12in. x 84in.
Height at rest	5in.
10in, and 5in, Roller Centres.	
TYPE E.W.U/S.	
Face (T Slotted)	. 8in. x 5in.
Sin, and Sin, Roller Centres.	

N.P.L. Certificate supplied at cost if required Guaranteed accuracy 0.2 minutes of arc. Can be supplied with electric magnetic or non-electric magnetic face.

WINDLEY BROTHERS LIMITED

CROWN WORKS . CHELMSFORD . ENGLAND

For Arno Sales & Service consult:

Nº 5 FACING AND BORING MILLER

is of massive construction and designed for handling work beyond the scope of a conventional miller. Equipment includes vertical attachment, slotting attachment, separate boring head, outer stay, etc.

PIDGEN BROS

HELMET ROW, OLD STREET, LONDON, E.G.1. Tel.: Clerkenwell 6481

Apri

NORTON A.P.I

AIR PRESS

* ONE TON CAPACITY

FOR ALL FORMS OF RAPID LIGHT BLANKING PIERCING, RIVETING AND ASSEMBLING OPERATIONS

Powered by a 3in. dia. cylinder, it gives a one ton blow on an air line pressure of 80 lbs. p.s.i.

FOR HAND OR FOOT OPERATION

STROKE (ADJUSTABLE) 0	TO	lin.
BASE TO RAM WHEN UP		6in.
CENTRE TO BACK	:	3lin.

T. NORTON & CO. LTD.

MANUFACTURERS OF HAND, FOOT & ARBOR PRESSES FOR OVER 50 YEARS CARVER STREET, BIRMINGHAM, I. Phone CENtral 4325/9. Grams NOTRONCO, B'ham

130 SHAFTS FACED AND CENTRED PER HOUR

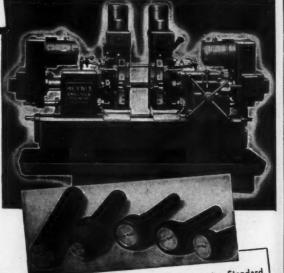
Facing $\frac{1}{8}$ off each end and drilling $\frac{7}{18}$ centres in $2\frac{1}{2}$ diameter Electric Motor Shafts in a floor to floor time of 27 seconds, is typical of the high production which can be achieved on the —

HEY No. 3 DOUBLE ENDED CENTRING & FACING MACHINE

- Perfect alignment of centres
- True faces and accurate lengths
- Turned finish on faces
- Eliminates subsequent facing down to centres or recentring



ENGINEERING CO. LTD.
COVENTRY PHONE: COVENTRY 88641



We also manufacture Rotary Cam and Profile Hilling Machines, Short Thread Hilling Machines, Huitiple Drilling Heads and Machines, Tapping Machines, Gear Tooth Rounding Machines, Special Machine Tools for blish Productures. Face 5" diameter, Standard Vices for maximum ber capacity of 6½" or 8" diameter. Minimum length handled 3". Standard bed length to take work up to 24", 48", 72" or 108" long.

NRP 1522



-and so will you if you specify

Special chipping characteristics eliminate swarf jamming.

Automatics can operate at maximum speed and feed.

Longer tool life—normal angles on tool tips can be used.

Lower labour costs—one man can watch several machines.

Output dramatically increased.

ALMINAL 152

ALUMINIUM ALLOY

FREE MACHINING BAR

Write TODAY for Full Technical Details.

bar

8" ngth bed

p to

RP 1522

Southern Forge LTD

MEADFIELD ROAD . LANGLEY . BUCKS

Telephone: LANGLEY 30!

ALUMINIUM AND ALUMINIUM ALLOY EXTRUSIONS TUBES AND FORGINGS

Api

Wadkin

The Dunbar & Cook Collet Chuck



Designed for use with "Ward" 2A, 3A, or "Herbert" 2D and 4 Senior Capstans and Air Operated Lathes, this oversize collet chuck enables second operation work up to four inches diameter to be accommodated but retains all the benefits of a ball chuck. Can now be supplied as an Air Chuck to suit any lathe.

SPECIALISTS IN THE MANUFACTURE SPECIAL PURPOSE MACHINES, JIGS &

> JOHN STREET.

BIRMINGHAM.

Phone: ASTon Cross 4101 (5 lines)

Grams: "CUBAR" BIRMINGHAM

SPEED UP your BAR WORK with ACCURATOOL CAPSTANS



4" turning length. Lever operated compound slide swivelling up to 45°. Unusually sen-

sitive and versatile. Lever operated collet (air operated collet extra). Eight spindle speeds 75-3000 r.p.m. Single lever selects High or Low speeds Forward and Reverse. Many useful items of optional equipment.

SOLE WORLD DISTRIBUTORS:

Write today for fully Illustrated folder M/II8b.



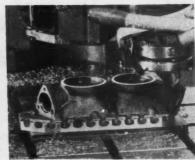
DOWDING & DOLL LTD

346 KENSINGTON HIGH STREET, LONDON, W.14 Tel: WESTERN 8877 (8 lines) Telex: 23182 Grams ACCURATOOL LONDON TELEX and also ACCURATOOL, SECOND **OPERATION LATHES** for work up to nearly 3" diameter

118b.







Wadkin Articulated Arm Router L.C.6

Face-milling Valve Body components on a Wadkin type L.C.6.

Wadkin Articulated Arm Router cuts machining times by more than 50%

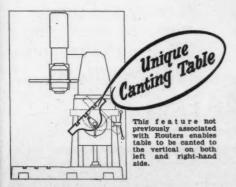
on light alloy components

Merrett & Co. Ltd., Tewkesbury are yet another firm who have taken advantage of the new Wadkin High-speed Milling Techniques.

Their Wadkin Articulated Arm Router, type L.C.6, recently installed to meet rising production costs, has cut machining times by more than one half! Type L.C.6 is a relatively inexpensive, medium capacity machine with cutting speeds up to 18,000 r.p.m. It has power rise and fall to the head, integral base plate, and rising and falling canting table. Details of the L.C.6 and the Heavy Duty Machine, type L.C. with either 6ft. 0in. or 8ft. 0in. reach are given in Leaflet 945. May we send you a copy?



Wadkin type L.C.6, face-milling a Valve Body Outlet, for Teddington Aircraft Controls Limited, at D. Merrett & Co. Ltd., of Tewkesbury.



COND

nearly

118b.

Wadkin

HIGH SPEED MACHINE TOOLS

Wadkin Ltd., Green Lane Works, Leicester. Tel: 68151 London Office: 62-64 Brook Street, W.I. Tel: MAYfair 7048

Ap



We are pleased to announce that we have been appointed SOLE AGENTS in London, Southern and Eastern Counties for 'EDIBRAC' Carbide Tipped Lathe Tools and Tips, Twist Drills, Lathe Centres, Reamers, Milling Cutters, etc.

Special Tools to customers drawings

Ask for Catalogue

GEORGE HATCH LTD.

3 QUEENHITHE, UPPER THAMES STREET, E.C.4

Telephone: CENTRAL 7751





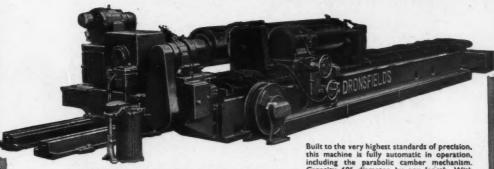
BLOOMSGROVE WORKS NOTTINGHAM

Phone: NOTTM, 75127 (317ns) GRAMS: MANLUVES, NOTTM: LONDON DEFICE: 41 8 42 PAHLIAMENT ST. WESTMINSTER S.W.I. Phone: WHITEHALL 5931-2

961

DRONSFIELD'S

*THE name for Roll Grinding and Turning Machines



Model 501 ROLL GRINDING MACHINE

Built to the very highest standards of precision, this machine is fully automatic in operation, including the parabolic camber mechanism. Capacity 60° diameter by any length. With speeds from 6 to 54 r.p.m. Wheel traverse I to 60° per min. Ask for brochure.



Made in three sizes for rolls up to 66" diameter by 120" long. For turning, parting-off, ending out, facing and grooving. Versatile and powerful.



ROLL GRINDING MACHINE

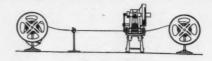
Several sizes for work up to 11" diameter by 120" long. Precision built throughout with infinitely variable traverse speeds, from 0 to 100" per min. through dependable hydraulic system.

DRONSFIELD BROS., LTD..

ATLAS WORKS · OLDHAM · ENGLAND Phone MAIn (OLDHAM) 3857 (3 lines) Grams "ATLAS OLDHAM"







Call it what you like

Reel, Winder, Coil Holder, Uncoiler, Swift, Coil Stand, Feeder, Decoiler, Spulenhalter, Dispositif d'amenage automatique, or "That thing you put the coil of steel on."

but use one made by:—

W. T. ATKIN (TOTTENHAM) LTD

178, St. Ann's Road, London N.15 Phone: STAmford Hill 6686-7

Overseas Cables
"Pressing London, N.15".

THERE'S PLANT CAPACITY AT CARRON





It pays to use the production resources of Carron Company. 250 acres of plant for casting, forging, machining, enamelling and sheet metal fabrication are on call to manufacturers who find it uneconomic to tool up for the special job. The technical advisory service of Carron is ready at all times to help iron out production problems.

out production problems.

Consider this plant capacity for medium heavy machining: planing, vertical and horizontal boring mills; milling and drilling of work up to 5 tons; moulding and machining capacity for non-ferrous components up to 5 cwts., including high speed routing and precision milling. Fabrications, too, light and heavy gauge, stainless steel, press tools, welding. From small light gauge sheet metal to large plate welded fabrications, Carron can quote.



CARRON COMPANY · CARRON · FALKIRK · STIRLINGSHIRE

LONDON OFFICE: 15 UPPER THAMES STREET, E.C.4. CENtral 7581 (4 lines) and at 22-26 Redcross Street, Liverpool, 1. 125 Buchanan Street, Glasgow, C.1. 33 Bath Lane, Newcastle upon Tyne.

SPECIALISTS in used and

reconditioned machine tools

IMMEDIATE DELIVERY USED MACHINE

AUTOMATICS

ACME-GRIDLEY 14in. Six-Spindle Bar Autos. ACME GRIDLEY 64in. RAC Six-Spindle Chucking Autos.

B.S.A. ACME-GRIDLEY \$in. Six, 1\$in. Six, 2\$in. Four-Spindle Autos.

B.S.A. Jin. Single-Spindle Automatic. B.S.A. 9in. Single-Spindle Chucking Automatic. POTTER & JOHNSTON 5D Chucking Automatics. WICKMAN 7 in. Automatic.

GRINDERS

B.S.A. No's. 7 and 8 Centreless Grinders. CHURCHILL 'HCY' and 'HBA' Internal Grinders.

LANDIS 4 x 12 Type C Plain Grinder. LANDIS 4 x 18 Type C Plain Grinder. LANDIS 6 x 18 Type C Plain Grinders.

Offered subject to prior sale. All machines motorised suitable for 400-440 volts, 3 phase, 50 cycle supply. LANDIS 10 x 72 Type C Plain Grinder. ORCUTT 20in. Spline Grinder.

DRILLERS

HERBERT, CORONA, J & S, ARCHDALE 1-2-3-4 Spindle POLLARD 21A Vertical Drill (Indexing Table). BECKER Unit Head Vertical Multi-Drill.

GISHOLT 1L & 2L Capstan Lathes. HERBERT 2D & No. 4 Capstan Lathes.

ALSO

B.S.A. 6 x 12 and 28 Multi-Tool Lathes. B.S.A. 50H Honing Machines. EX.CELL.O Fine Boring Machine.



We offer good prices for your surplus plant. Send us details—we will inspect immediately and make a firm offer. Write, wire or phone . . .

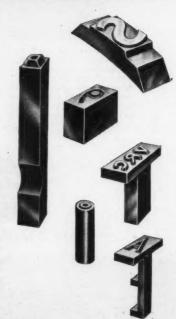
SPECIALISTS

IN STEEL TYPE.

long short round square thick thin

awkward shapes

Standard type for engineers too. Send for catalogue





11' 0" guillotine shear, with hydraulic gripper mechanism and shadow line lighting, for cutting mild steel }" thick.

GUILLOTINE SHEARS BY



The Butterley range of sheet metal machinery includes geared and ungeared power presses, guillotine shears, press brakes and general machinery for the hot and cold working of metals. All castings are made by the "Meehanite" process in our own well-equipped foundries. The Butterley foundries are available for the production of high-grade "Meehanite" castings to customers' requirements. We invite your enquiries for "Meehanite" castings of all grades up to 20 tons.

The word "Mechanite" is a registered trade mark.

Full details of Butterley Sheet Metal Machinery supplied on request . . .



14

THE BUTTERLEY COMPANY LIMITED, RIPLEY, DERBY, ENGLAND. Tel: RIPLEY 411 (9 lines)
London Office: 9 Upper Belgrave Street, S.W.I. Tel: Sloane 8172/3

SM23

you want Whenever first - class SHEET METAL WORK phone CORNERCROFT Coventry

We have the "know-how," the skill and every possible facility to make large or small components and assemblies, one-off prototypes, experimental work or production runs—we are experienced in all assemblies, one-off prototypes, experimental work or production runs—type of welding plant materials. Including stainless steel and Titanium and have every conceivable. Not least important—not least important and tool room, and too

CORNERCROFT LIMITED (The Cornercroft Group of Companies)

ACE WORKS, COVENTRY - COVENTRY 23391

PODMORE BOWL FEEDERS



- are made in a variety of capacities and with multiple or single outlets for clockwise or anti-clockwise feeding. They can also be

adapted to numerous uses—for counting and inspection, sorting and arranging of components for machining, pressing, etc.

Let Podmores solve your feeding problem

This is a 24" Bowl Feeder, feeding Alarm Clock wheels for assembly, at the works of WESTCLOX LTD.

HANLEY STOKE-ON-TRENT STAFFS

1/2

EXPERIMENTAL SPRINGS?



Select your springs here

No. 1217
One gross Assorted Springs 42/-



No. 1200 Three dozen Assorted Light Expansion Springs, suitable for carburettor control, etc. 15/-.



No. 760 Three dozen Assorted Light Compression Springs. 1" to 4" long, 22 to 18 S.W.G., 4" to 4" diam. 7/6,



No. 98A Three dozen Assorted 1" to 4" long, ½" to ‡" diam., 19G to 15G. 6/6.



No. 757
Extra Light Compression, 1
gross Assorted, § to ¼ diam.,
[" to 2½" long, 27 to 19 S.W.G.
18/-.



No. 753
Three dozen Assorted Light
Expansion ‡" to ‡" diam., 2" to 6"
long, 22 to 18 S.W.G. 12/-.



Fine Expansion Springs. 1 gross Assorted \$" to \$" diam., \$" to 2" long, 27 to 20 S.W.G.

That spring you want . . . in a hurry . . . where is it? Pick what you want, when you want it, from TERRY's BOXES OF ASSORTED SPRINGS -our fine range of small boxed assortments of experimental springs. We can show you only a few from the range here. Send a postcard for our full listand if ever you're stuck with a spring problem send it along to our Research Department—they'll gladly help you out.

Have you a Presswork problem?

If so, the help of our Design Staff is yours for the asking.

TERRY'S for SPRINGS



Really interested in Springs? "Spring Design and Calculations" 10th Edition tells allmost free 12/6.



Cut Production Costs with Terry's Wire CIRCLIPS. We can supply immediately from stock — from 1 to 1 to 1.



Looking for good Hose Clips? Send for a Sample of Terry's Security Worm Drive Hose Clip and price list.

HERBERT TERRY & SONS LTD.

Redditch, Worcs.

(Makers of Quality Springs, Wireforms and Presswork for over 100 years.)

HTHE

NEW to the range of _ELLIO





HACKSAWS NOW A 6" MODEL ONLY £120 1 H.P. ELECTRICS

Cuts round material up to 6in. diameter. Cuts square material up to 6in. square. Angular cuts at 45° up to 3\frac{1}{2}in. round and 3\frac{1}{2}in. x 6in. (vertical) section. Size of saw blade-14in. x 11in. x 6 T.P.I. Length of stroke 51in. Motor 1 h.p. x 1430 r.p.m.

ELLIOTT (MACHINERY) LTD. (MEMBER OF THE B. ELLIOTT GROUP)

VICTORIA WORKS . WILLESDEN . LONDON, N.W.10 Telephone: ELGar 4050 (10 lines) Telegrams: Elliottona, Harles, London Overseas Subsidiaries: CANADA, U.S.A., AUSTRALIA, S. AFRICA



NRP 5049



Collapsible

THREADING TAPS

Stationary and Rotating Types

Also: Adjustable Taps Adjustable Cutter Heads Centre Setting Gauges Special Tools, Jigs, Fixtures, etc.



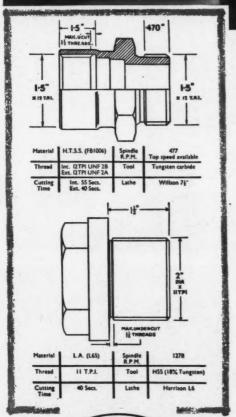
JIG BORING ON No. 4G "SIP" JIG BORER

DURABLE TOOLS LTD.

81-89, AVENUEPARK STREET, GLASGOW, N.W.

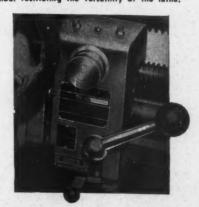
Telephone: Maryhill 2344 Telegrams: Durable, Glasgow





In the same way that the chasing dial has superseded the old method of marking chuck, headstock, leadscrew collar and bracket; the AINJEST HIGH SPEED SCREW-CUTTING ATTACHMENT has established a further major advance in screwcutting techniques. Its use on standard centre lathes allows the automatic engagement and disengagement of the leadscrew at the highest spindle speeds of which the machine is capable.

- * The cut cannot be started at the wrong point.
- ★ The cut is stopped accurately so that external or internal threads can be cut tight to a shoulder at high speeds.
- ★ Tungsten carbide tools can be used with great advantage.
- * Chasing dial is eliminated.
- ★ The attachment remains in position, ready for use without restricting the versatility of the lathe.





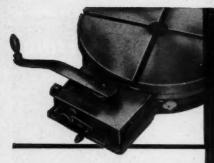
High speed SCREWCUTTING ATTACHMENT

stockists of carbide threading tools

Write for details and prices to Dept A.S.C.

R

SAUNDERSON & COSTIN LTD · HIGHCLERE · NEWBURY · BERKS · ENGLAND · Tel.: HIGHCLERE 448



PEISELER Circular Indexing Tables and Quick Clamping Drill Jigs



PEISELER CIRCULAR INDEXING TABLES Hand & electrically operated

These tables incorporate hydro-mechanical faceplate clamping and give maximum stability, high-grade indexing accuracy together with quick indexing action. They have a low overall height and are simple to use and reliable and foolproof in service. in service.

The illustration on the right shows two Pelseler quick clamping drill jigs used in conjunction with a Peiseler Circular Indexing Table.



PEISELER OUICK CLAMPING DRILL JIGS

These jigs incorporate a built-in clamping system with inter-changeable drill and location plates. They replace expensive special jigs and rough templates, give rapid clamping with complete accuracy combined with rigidity. Even small batches can be jigged economically and a great variety of workpieces can be produced in the same jig merely by exchanging the drill and the location plates.



MACHINE SHOP EQUIPMENT LTD. Spenser St., London, S.W.1. Tel. VICtoria 6086

C.D.285



Manigley SUTZ BE SUISSE

AUTOMATIC FEEDING AND SELECTING UNITS

- 6 types with bowl diameters from 31/2 in. to 12in.
- Specialised tooling can be supplied.

Phone: Tate Gallery 0656

Send for details to Sole Agents for U.K.:-

W. F. HAMILTON & CO. (Importers) LTD. 145B ASHLEY GARDENS, LONDON, S.W.1.

761

rith with hes and can jig

086

G

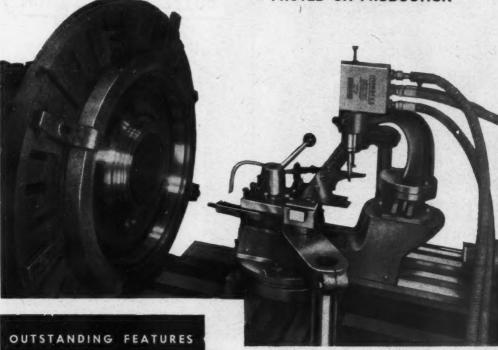
om

ed.

HYPROFILE,

UNIVERSAL HYDRAULIC DUPLICATING ATTACHMENT
A COMPLETE PORTABLE UNIT EASILY FITTED TO ANY
STANDARD MACHINE TOOL

PROVED ON PRODUCTION



- 1. A Universal Hydraulic Duplicator for Lathes, Shapers, Planers, Boring and Grinding Machines.
- Low cost duplicating of parts or contours on the face, diameter, or bore.
- Swivelling Tracer Bracket through 360 enables 90 angles and undercuts to be produced at high speed.
- Rotating cut Control Slide through 360 allows the cut to be fed in at the required angle.
- Any position Template Holder to suit job or the
 Operator, easy access for changing the template
 or stylus.
- 6. Template can be set at minimum distance from the tool giving rigidity and accuracy in full view of the operator.
- 7. Can be installed by the Operator in minutes, and fits any standard-Machine Tool.
- 8. No brackets to make
- 9. No holes to tap
- 10 Ready for use on delivery

PROFILE TURNING MOTOR CAR TYRE MOULD, WITH TEMPLATE ATTACHED TO SADDLE, EN-ABLING WORKPIECE TO BE REMOVED WITH-OUT DISTURBING SET-UP

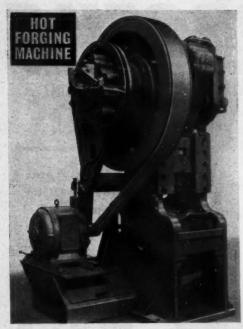
Send us your profiling problems and arrange for a demonstration!

ARMYTAGE (TOOLS) LTD.

FOUNDRY LANE · KNOTTINGLEY · YORKSHIRE · ENG.
Telephone 2743-4

This illustration is the subject matter of British and Foreign Patents.

Descriptive Catalogue supplied on Request



NYLON AND LEATHER

COMBINE TO FORM
THE FINEST BELT
KNOWN TO INDUSTRY

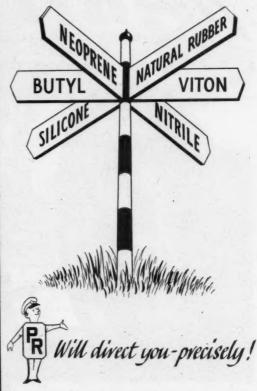
The Miraclo Belt represents the ultimate in efficient belt transmission. Miraclo embodies a nylon core permanently bonded to chrome butt leather by our own unique process. The result? It's enormously strong yet amazingly light and flexible. The nylon provides elasticity but with virtually no permanent stretch. We'll be glad to send you further details and sample of the Miraclo Belt.

FREE. Send for this new 12 page colour brochure No. 203, which fully explains in word and picture the Miraclo Nylon-Core Belt—the belt that performs miracles.



STEPHENS BELTING CO. LTD. Snow Hill, Birmingham, 4. IRA STEPHENS Ltd. Whitelands Ashton under Lyne

Which way in rubber ?

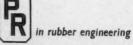


P.R. Research Laboratories offer the widest range of synthetic rubber compounds available, all developed to meet the exacting and varied working conditions of modern industry.

P.R's advanced production techniques and the strict control of all manufacturing operations ensure mouldings and extrusions of the highest grade and to close dimensional accuracy.

Please write for technical literature.

The symbol of precision



PRECISION RUBBERS LIMITED BAGWORTH LEICESTER Tel: BAGWORTH 361/6

ARCHD

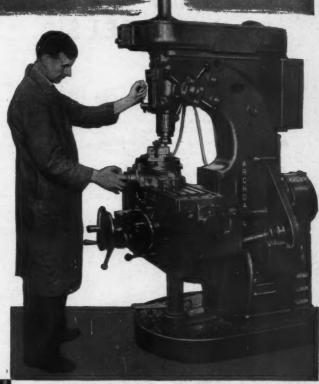
18 VERTICAL MILLER

WITH FIXED OR SWIVELLING HEAD

With a range of eighteen spindle speeds from 80 to 2,000 r.p.m. and four rates of automatic longtitudinal table feed for each speed, these machines are capable of handling a very large range of work at fast rates. At Integral Ltd., Wolverhampton, several operations are carried out on aircraft hydraulic pump casings as shown.

Table working surface 10in. by 31in. Maximum distance, spindle nose to table 18in. Available with fixed or swivelling head.

Ask for details.



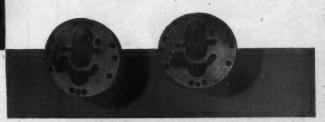


JAMES ARCHDALE & CO., LTD.,

BLACKPOLE WKS., WORCESTER. Phone: Worcester 27081 (7 lines)

A Member of the Staveley Coal & Iron Co. Ltd. Group

* WIDE RANGE OF SPEEDS FOR **MAXIMUM PRODUCTION ON** ALL MATERIALS



Sole Agents: ALFRED HERBERT LIMITED, COVENTRY. Telephone No. 89221 When answering advertisements kindly mention MACHINERY.



Aluminium Alloy HANDWHEELS

- Range of sizes: 2in. 33in., 5in., 6in., 63in.,
 7in., 9in., 10in. (dias.).
- Supplies ex-stock (un-machined boss).
- Supplied WITH or WITHOUT Standard Pattern Handle (5in., 7in., 10in. sizes only).
- Outer circumference and handle machined and polished (except 2in. size).
- Handwheels can be supplied with boss un-machined or machined to customer's requirements.
- Any quantity supplied.

Send for our Brochure—detailing prices and maximum dimensions for machining.

★ We can also supply you with your Gravity and Pressure Diecastings.



No more trial and error methods of drill sharpening.

With a Hunt Drill Point Grinder you get a perfect point every time, with the minimum of waste.

Drill points can be changed to suit different requirements quickly and easily, without the need of a skilled operator.

For longer drill life, more accurate holes and faster rates of penetration — invest in a Hunt Drill Point Grinder.

Ask for details of our range.

down
to
the
point
of
a
Drill



MAGNAL PRODUCTS LTD
YATE BRISTOL

AL CHIPPING SODBURY 2001 Flores Grams MACHALY



HUNT
MACHINE TOOLS

TWIST DRILL POINT GRINDING MACHINE

HERBERT HUNT & SONS LIMITED

MACHINE TOOLS

Elsinore Road, Old Trafford, Manchester 16
Tel: Trafford Park 8663/4. Grams: HUNTING, MANCHESTER 16





Unlike the gentleman with the one-man band we are not given to blowing our own trumpet. But we can justly claim that the Clare system of milling equipment has an even greater degree of versatility in its own field than the one-man band has in his.

A range of 7 Clare chucks is available and in any one chuck, within its capacity, a variety of end mills, shell mills, face mills, boring tools, arbors, etc., can be used and interchanged without having to remove the chuck from the spindle. This outstanding tool versatility can show a considerable saving of expensive 'idle' machine time.

CLARE COLLETS LTD. Wright St., Broadheath, Altrincham, Cheshire. Tel: Altrincham 3701/2. Grams: Clarechucks, Altrincham.



ADVANTAGES

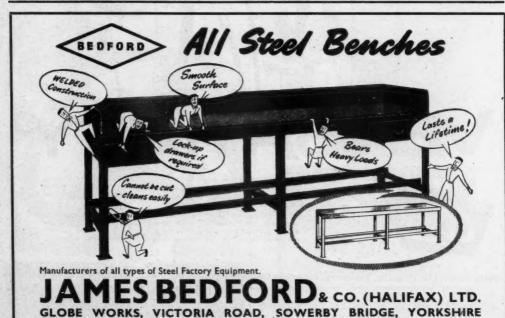
- ★ To the user—Increased productivity with increased working capital. Economies made possible by scrapping obsolete machinery.
- ★ To the supplier—Will not lose customers by failing to offer credit facilities.
- ★ To both—Progressive expansion by the maximum use of the MUTUAL PLAN.

Write for a copy of this booklet NOW

MUTUAL FINANCE LIMITED

Telephone: Halifax 81800

A Mercantile Credit company
201 REGENT STREET, LONDON, W.I, AND BRANCHES
Member of Finance Houses Association



ed

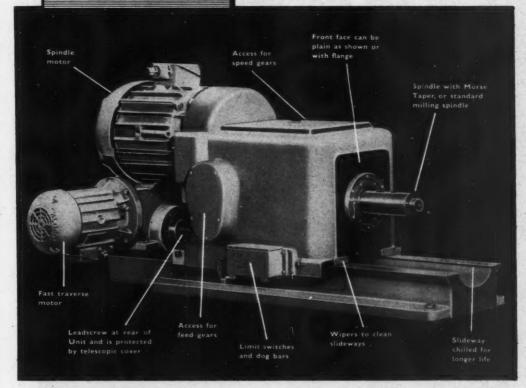
ble

ng

ise

AMT

UNIT HEADS



Available in

4 SIZES from 1 to 20 H.P.

for DRILLING, JUMP GAP DRILLING, COUNTERBORING, TAPPING, BORING, DEEP HOLE DRILLING, 'SPOT FACING' AND MILLING



BROCHURE
ON REQUEST FROM

A. M. T. (B'HAM) LTD.,
BOURNBROOK, BIRMINGHAM 29.

Telephone: SELly Oak 1128/9/20.
Telegrams: AMTOLD, BIRMINGHAM.

AEI engineers
know the Machine Tool
Industry

This large Asquith ram-type horizontal-spindle boring and milling machine is fitted with AEI drives and control equipment.

There are AEI engineers who specialise in meeting the electrical needs of machine tool manufacturers. They have become virtually a part of the machine tool industry, and are always ready to advise on electric drives and control equipment for machine tools of all types and sizes.

AEI ELECTRIC DRIVES



Associated Electrical Industries Limited

Motor and Control Gear Division

RUGBY ENGLAND

COMBINING THE MOTOR AND CONTROL GEAR INTEREST OF BTH AND M-V

A 5529

A century of 'Know-how' builds 47 HORSE-POWER into the

32 H.P. on the HORIZONTAL MILLING SPINDLE

plus
5 H.P. for the
TABLE FEEDS

plus
10 H.P. on the
VERTICAL
Universal SPINDLE

Table Size: 76¼in. by 19in. Capacity: 55in. by 17¾in. by 23½in.

Horizontal Spindle: 36 speeds from 16 to 1400 r.p.m.

Ram Head: 18 speeds from 40 to 2000 r.p.m.

Dual Control Positions.

Backlash eliminator. Automatic cycle.

Designed for use with

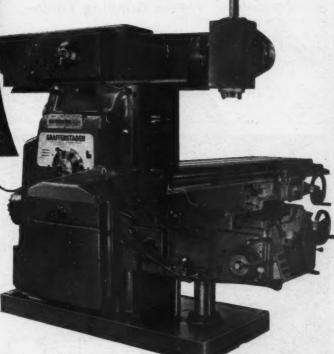
Carbide and Ceramic Milling Cutters.

th c Milling Cutte

GRAFFENSTADEN

HYPER MILLING MACHINE

MODEL H.142



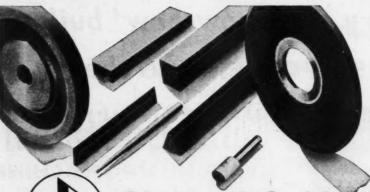
A Graffenstaden machine offered exclusively in the U.K by

ACBARS LTD

CECIL HOUSE. 57a, HOLBORN VIADUCT, LONDON, E.C.I

Telephones: CENtral 6811/2, 2187/8/9 Telegrams: "Acfirb," Cent, London

DEGUSSI



CUTTING FINE -VERY FINE

Sintered Oxide Cerami

Fine Grinding Tools-

The slow, even wear, outstanding precision, and mirror finish you get with Degussit Fine Grinding Tools are due to the poly-crystalline structure of their substance. They are

not just bonded abrasives, but are made not just bonded abrasives, but are made from sintered oxide ceramic material—hard and homogeneous. That is why Degussit —wheels, points and files, keep their shape much longer than bonded abrasives and are the most economical of all fine grinding tools. Send for our comprehensive cata-logue B6/4 and sample.

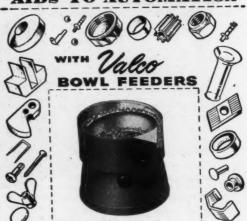
If you are unable to obtain your requirements from your local stockist, write to:-Sole concessionaires for the United Kingdon

BUSH BEACH & SEGNER BAYLEY LIMITED

St. James' House, 44 Brazennose Street, Manchester 2, Tel: Deansgate 5134 (5 lines) Telex: Chemicals, Mchr. 66180







For the feeding of small components to automatic machines of all descriptions. Components are fed out in single file in correct alignment to be received by the machine. Rate of feed variable, easily set to suit the particular job. Feed tracks can be designed to handle awkwardly shaped components in the manner required.

Bowl Feeders available in a range of sizes from 6° to 36' diameter.

MANUFACTURERS OF VIBRATORY FEEDING AND ELEVATING EQUIPMENT FOR POWDERS, GRANULES, ETC.

VALLEY PRODUCTS (LYE) LTD

Lliminate manual measuring operations with 'Deltameter' dimensional control!

Your older machines can produce to .00005" tolerances with the continuous reading 'Deltameter'

The Johansson 'Deltameter' provides a continuous

dimensional check during manual or automatic grind-

MACHINE SHOP FOREMAN SAYS:

"' Deltameter' installations brought older machines into operation again, eliminated rejections, and saved hours of manual checking by conventional methods. What's more, as the component size is continually shown on the face of the instrument, I can use less skilled operators."

ing operations. Operating from any factory air supply above 25 p.s.i. pressure, the 'Deltameter' provides an immediate dimensional check while the component is being produced. Electrical contacts operate a coloured light signal system, or provide automatic control through a relay unit.

The Johansson 'Deltamatic' is a universal instrument for machine control. It includes the basic 'Delta-meter' measuring head and visual indicator, plus a built-in relay unit.



ENT

Write for information to: HANSSON LTD.

Specialists in threading and precision measurement.

SOUTHFIELDS ROAD, DUNSTABLE, BEDS.

TELEPHONE: DUNSTABLE 62422 (4 lines)

DHB 7830

SISTEM STATE **Drilling Machines**

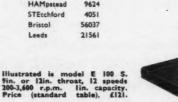
Arboga drilling machines are available as bench, pillar or radials in capacities from Jin. to IJin. A good range of equipment is available, as, for example, the rotary table on compound base (illustrated) mounted in lieu of the standard round or square table.

ALL ARBOGA PRODUCTS ARE SO THROUGH FOLLOWING DISTRIBUTORS:

A. DOUGLAS CO. LTD.
MITCHELLS OLDFIELD LTD.
MONKS & CRANE LTD.
MONKS & CRANE LTD.
JOSEPH PUGSLEY & SONS LTD.
J. & H. SMITH LTD.
VICTA ENGINEERING CO.

High Wycombe Glasgow London Birmingham Brissol Leeds Poole

High Wycombe 4390 **SCOtstoun** HAMpstead 9624 STEtchford 4051 Bristol 56037 21561 Leeds



KAVANAGH O'MOORE & CO., LTD.

Ist. FLOOR . 34/35 QUEEN STREET . LONDON . E.C.4.

Telegrams: "Toledoro Cent London" Telephone: CITy 2847

Skilled hands orstilled hands?

Every year thousands of skilled hands are stilled for weeks, even months, by dermatitis. It's all so unnecessary. Working hands can be protected. Among the recognised measures is the application of a Rozalex Barrier Cream before work. There are 12 of them for use according to the industrial irritant encountered.

AFTER WORK new Rozalex Industrial Skin Cleanser removes contaminants quickly and safely.

Other specialised Rozalex products include Stain Removing Cream, Resin moving Cream and Waterless Skin Cleanser.

ROZALEX

Write for details to ROZALEX LIMITED The Pioneers of Barrier Creams 10 NORFOLK STREET, MANCHESTER 2 . BLACKFRIARS 1122-4

M.A.S.S.

TOOLS LTD.

Specialists in Tooling Equipment **And Special** Purpose Machinery

Jig-Boring, Press Tools, ligs and Fixtures; Special Purpose Machin:s, etc. Manufacturers of Small Precision Mechanical Devices. Precision Grinding, Internal and External

Patterns and Castings in any Quantities.



A.I.D. Approved



RIDGE ROAD CORNER. STONECOT HILL, NORTH CHEAM SURREY 9 'Phone: Fairlands 8861/2. ENGINEERED BY

HABIT'

The 'TENNER'

MALE & FEMALE RADIUS DRESSING FIXTURE

A simple, sturdy, reliable radius dressing fixture, fully protected against dust, and accurate to close commercial limits.

The 'Tenner' has no frills, but can be relied upon to give good service over a long period.

The name 'Habit' is a guarantee of quality irrespective of price.

CAPACITY

n t

H

TEN/TWENTY

0 — 3in. Female 0 — 3in. Male radii on wheels up to 8in. dia.

TEN/FIFTY

0 — 3in. Female 0 — 3in. Male radii on wheels up to 12in. dia.

OPERATION

By direct motion from handwheel check stops at 90° and 180°.

SETTING

By gauge blocks, height gauge or micrometer.

FITTING

Can be held by magnetic chuck, vice or clamping to bed directly

PRICE

TEN/TWENTY £12

Ex works London

Postage, container and packing inland 5/-. Suitable diamond Tool 35/-.

A GREAT LITTLE FIXTURE

HABIT DIAMOND TOOLING LTD., LURGAN AVE., LONDON W.6. Tel.: FULHAM 7944

HABIT

DELIVERY CONSCIOUS DIRECTORS DEMAND NECO D.C. MOTORS



And we supply them from \$\frac{1}{8}\$ to 2 H.P.

12 volts to 600 volts foot or flange mounted \$\frac{1}{20}\$ to 20,000 r.p.m.

Drip proof, TE. or T.E. fan cooled.

Geared (10 types) or ungeared.



NORMAND ELECTRICAL CO. LTD NORTH STREET · LONDON · S.W.4

MACaulay 3211-4. Neconditi, Clapcom, London.

rugged robust reliable



Write for full details to:

SMITHS hand tachometer

Measures Rotary, Linear or Surface Speeds in r.p.m. or f.p.m. (metric reading if necessary) to within \pm 4%, even in awkward places.

AVAILABLE IN FIVE MODELS

- * Self-powered, needs no battery.
 Always ready for immediate use.
- Always ready for immediate use

 Protected against sudden accel
 eration even above full scale.
- Pointer lock device holds reading until convenient to view dial.

£15.10.0 (Complete with case and accessories) P & P 4/6 extra

MITTER INDUS

INDUSTRIAL DIVISION

The industrial business of S. Smith & Sons (England) Ltd, including the marketing of industrial products under the trade marks of Smiths and Kelvin Hughes

Chrones Works, North Circular Read, London NW2 - Phone: GLA 8444



 HARD THREADS IN SOFT MATERIALS
 NEW THREADS IN DAMAGED COMPONENTS
 FULL RANGE OF SIZES AND THREAD STANDARDS IMMEDIATELY FROM STOCK

CROSS MANUFACTURING CO. (1938) LTD. BATH, SOMERSET. TEL: COMBIE DOWN 2385-8. GRANE: CRICIA, BATH

Specialists in the manufacture of jet Engine Labyrinths, Circlips, Spring Washers, Springs, etc.

Metal sawing problems?

Cold sawing machines are our speciality whether for ferrous, non-ferrous or difficult metals and we have an extensive range of standard machines which cut quickly – and accurately.

We also build machines for special applications.

If you have a cold sawing problem our experience could probably provide the solution. May we help you?

METAL SAWING & SAW SHARPENING MACHINES

RUSSELL

S. RUSSELL & SONS LTD.
Bath Lane, Leicester

Backed by 45 years of specialised experience

SR 604

OVER 100,000,00

... OF COOLANT EVERY WORKING DAY ARE FILTERED BY

MARBAIX AUTOMATIC FILTRATION EQUIPMENT







LET US CLEAN COOLANT! GASTON E. MARBAIX LTD.

NRP 3467

Devonshire House, Vicarage Crescent, London, S.W.II.



MOSER CAMS & TOOLS LTD

465 HORNSEY ROAD, LONDON, N. 19

TELEPHONE: ARCHWAY 1766 & 7017

VERTICAL TURRET

MILLING MACHINE

A fully versatile machine with all-angle head

Longitudinal travel Cross travel Vertical travel 10 **Maximum distance** spindle to table 18" Spindle speeds (8) 80-2713 r.p.m.

> EARLY DELIVERY



Available through your local stockists

GATE MACHINERY CO.LTD

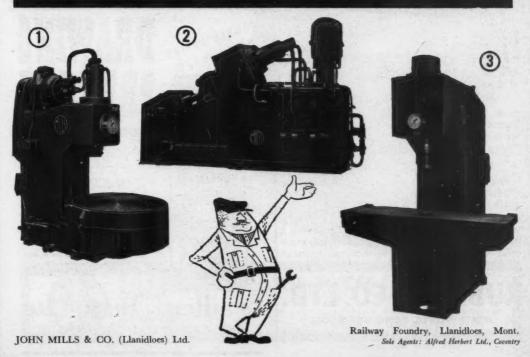
GOT A PRESSING PROBLEM? We may have the answer on file

If it's a question of how, when and where to press, consult our design staff—they are specialists in originating methods of manufacture and assembly for higher productivity. From their wide experience they may produce a ready-made answer—and even a ready-made press (from our standard range). Alternatively a specially designed and built press may provide the ideal answer in much less time than you'd think possible!

Currently doing jobs better, quicker cheaper are these three presses—

- Mills *Oilaulic' standard 6-ton Bench press with 12 position indexing table
- Mills 'Oilaulic' 60/20-to special inclined piercing and forming press.
- Mills 'Oilaulie' 60-tor vertical open gap pres

MILLS 'OILAULIC' PRODUCTS



ARE YOU AN **ENGINEER?**



If you are, you must be interested in surface finish control.

"RUBERT" SURFACE TROUGHNESS SCALES

Provide a quick, simple and inexpensive method of assessing surface finish.

No workshop can afford to be without a set. Even if you have a surface finish measuring instrument, Rubert Surface Roughness Scales are a "must" for all:

FOREMEN **INSPECTORS**

MACHINE OPERATORS **DRAUGHTSMEN**

In fact everybody who has any part in designing, producing and inspecting components of high

Illustrated is the pocket set No. 24 Mk. 11, containing 12 stainless steel specimens from 2 to 500 micro in. CLA. We can also supply more comprehensive sets and cylindrical specimens to B.S.S. 1134/1950 and B.S.S. 2634/1955.

ACRU WORKS, DEMMINGS ROAD. COUNCILLOR LANE, CHEADLE, CHESHIRE

Tel. Gatley 5855 and 6058





TWO STANDARD SIZES ARE

No. 715 (70 tons max. load) and No. 765 (150 tons max. load). Double or single action working. Especially suitable for deep draw, e.g., the larger machine can draw a 30in. diameter steel blank jin. thick, to a depth of 10jin. in one

Operation either manual, automatic single cycle or continuous cycles. Hydraulic system self-contained and completely sealed.

You are invited to send for further

' CALDWALL WORKS KIDDERMINSTER PHONE: 2217/8.



UP TO 1250 PIN HOLES PER HOUR,

CORONA

FIVE-SPINDLE HORIZONTAL PIN-DRILLING MACHINE

- · Capacity up to in. dia.
- Continuous Automatic Cam Feed
- Three Spindle Speeds
- Three Feed Ratios

Especially designed for high production drilling of retaining pin holes on a wide variety of components, this machine has continuous automatic cam feed. Loading and unloading is simple and all stations are easily accessible. This machine can be supplied with fixtures and cams to suit your own production needs, and we will gladly supply production estimates on request.





FREDK POLLARD & CO LTD

CORONA WORKS, LEICESTER, ENGLAND. TEL: LEICESTER 67534 (5 lines)

Landon Office:

COASTAL CHAMBERS, 15 ELIZABETH STREET, BUCKINGHAM PALACE ROAD, S.W.I. Tel: SLOANE 888

Scottish Representatives: Walter S. LANG & CO., 48 OSWALD ST., GLASGOW C.I. TEL: CENTRAL 2539

North East: HODSON MACHINE TOOLS LTD., 150 NEW BRIDGE STREET, NEWCASTLE-UPON-TYNE.

NUMBERING ON METAL

'EDA'

NUMBERING MACHINES

NUMBERING HEAD FOR METAL

Consecutive and Repeat Actions

Power, Fly, Hand or Pneumatic Presses and similar equipment



It is used for marking Aircraft components with reference numbers, part and drawing numbers, date of manufacture, inspection mark, for marking Shells, Bombs, Cartridges, Engine Parts, Motor Car, Motor Cycle, Cycle, Wireless, Electrical, Clock, Watch and other instrument parts in all materials. Checks. Labels, Name Plates, Pigeon Rings, in fact any article which requires an identification mark. Mass produced articles can only be satisfactorily identified by individual reference numbers.

W. LETHABY & Co. Ltd.

LEDA HOUSE, 124-132, CLERKENWELL ROAD, LONDON, E.C.I

Telephone: TERminus 1104 (5 lines)

SPRING DOWEL PINS

O JUST DRILL AND PIN O NO REAMERING



OCUT DOWN COSTS

Manufactured by the

LONDON PRESSED HINGE CO LTD Lion Works, Plaistow Rd., London, E.15

Tel.: Maryland 4355

Competitive Prices

As simple a Bc

engraving on the model 713

Gives reductions from 2:1 to 8:1. Easy operation enables engraving to be carried out nearly as fast as ordinary writing. Exceptionally sensitive balanced pantograph, giving automatic withdrawal of cutter and tracer. For full details write DAVID DOWLING LTD · HAROLD WOOD, ROMFORD TELEPHONE: INGREBOURNE 43904/5



For "standards" that are special

Jobbers' drills • taper shank drills reamers • milling cutters • end mills side and face cutters • angle cutters





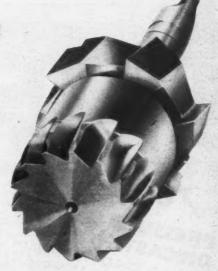
and "specials" that are extra special

"Lubricold" oil-hole drills • multidiameter sub-land drills • taper reamer drills • armour piercing and manganese drills • combined parallel drills and reamers • carbide tipped drills • engineers' tools of all kinds to specification

TALK TO

Stalker

Stalker Drill Works Ltd,. Drill Square, Sheffield 6.



Telephone: 343057

OA/5778

Other movements made to customers' requirements

HIGH PERFORMANCE FROM OLD MACHINES!

AIR-HYDRAULIC **PRODUCTION UNITS** & WORK TRANSFER UNITS

for Fast Approach and Return Speeds . . at a very sensible price.

3 STANDARD MODELS AVAILABLE

| Model 0 | Model 1 | Model 2 GIVES HIGHER PRODUCTION 0"-6" | 0"-6" | 0"-12" ON MILLING, DRILLING, Work Table ... | 12" x 44" | 18" x 64" | 26" x 94" | TAPPING AND BORING Approx. thrust | 180 lb. | 400 lb. | 800 lb. | MACHINES

Recommended air line pressure: 70/100 lb. per sq. in.

Feed rates are infinitely variable from 1 in. per min. upwards on 0 and 1 Models, and jin. per min. on Model 2. Special tables with feed rates down to jin. per min. are made for heavier work. The production Unit cylinder is cushioned on return stroke. Work Transfer Units have cushioned cylinders working against adjustable dead stops, stationing one component under the tool whilst another is being loaded.



FAST	HIED	-	
	,		
		•	

Diagrammatic illustration showing some of the mas cycles available.

THE WESTON MACHINE TOOL CO., LTD 210 BRACEBRIDGE STREET, ASTON, BIRMINGHAM 6. Tel: ASTon Cross 1788

REMEMBER PRESSURE DIECASTINGS ZINC B.S. 1004 OR ALUMINIUM LARGE OR SMALL THE PARTY OF THE P . Enquiries to

T.A.L. DEVELOPMENTS LTD.

BROADWATER WORES, GARMAN ROAD, TOTTENHAM, IL17 TELEPHONE: TOTTENHAM 2732/3

Automatic SHARPENER Slitting Saws Hacksaw and **Bandsaw Blades** .. accuracy with automatic sharpening

> Grinds Slitting Saws up to 154in. dia. Hacksaw blades up to 24in. × 28in. and Bandsaw blades I in. wide.

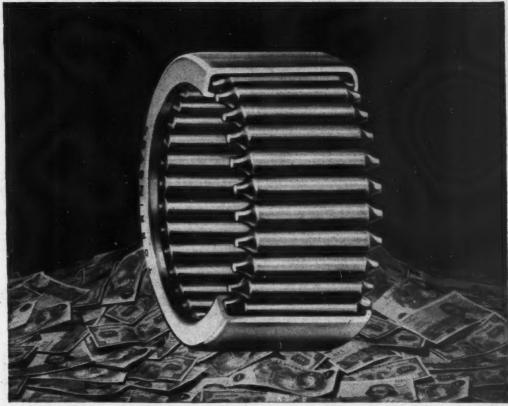
An accurate retoothing device is fitted. IMMEDIATE DELIVERY

Send for Comprehensive Illustrated Brochere Exclusive Distributors in the United Kingdom.

ELGAR

MACHINE TOOL COMPANY LIMITED

172-178 VICTORIA ROAD - ACTON - LONDON W.3 - Tel.: ACORN 5555 Midlands Showroom : 1075 Kingsbury Road, Birmingham, 24 Tel.: Castle Bromwich 3781/2.



SAVINGS PILE UP with **Torrington** needle bearings

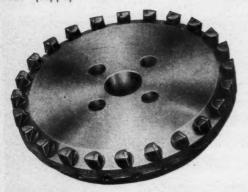
You get performance-plus at a low unit cost when you specify Torrington Needle Bearings. A full complement of small-diameter rollers provides a maximum number of contact lines. The result—a higher radial load capacity at a lower unit cost than any other bearing of comparable size or performance. Precision rollers operate smoothly and efficiently with a low coefficient of starting and running friction. Positive roller retention is ensured by turned-in lips on the outer shell, permitting faster and easier installation or assembly. Your Torrington representative is an expert on Needle Bearings. For full information on how they can bring savings and improved product design and performance call in Torrington.

TORRINGTON NEEDLE BEARINGS FEATURE:

- High radial load capacity
- Low coefficient of starting and running friction
- Low unit cost
- Long service life

TORRINGTON BEARINGS

BEARINGS DIVISION: TORRINGTON AVENUE, COVENTRY. THE TORRINGTON COMPANY LTD | LONDON AND EXPORT OFFICE: 7-10 ELDON STREET, EC2.



A NEW & ECONOMICAL ANSWER to an expensive problem.

Marwin Mark II Tungsten Carbide Tipped Facemills are amongst the most efficient inserted-blade cutters obtainable.

TYPE of BODY for 3 TYPES of BLADE slashes servicing costs!

Blades for either Cast Iron, Steel or Light Alloys are all fully interchangeable in any cutter body.

Low cost fixtures and gauges supplied for servicing on off-hand, surface or toolgrinding machines.

Let us demonstrate at your works.



TUNGSTEN CARBIDE TIPPED

MARWIN (ANSTEY) LIMITED TOOL & CUTTER MANUFACTURERS
ANSTEY · LEICESTER · Telephone: ANSTEY 3201/2 Engineering, Marine, Welding & Nuclear Energy Exhibition

STAND 19 (National Hall) OLYMPIA

APRIL 20th to MAY 4th

Our large and competently staffed Jig and Tool Drawing Office offers you a complete and unequalled service in the preparation of designs and working drawings for Press Tools, Jigs, Fixtures, Gauges and Special Purpose Machine Tools. Please write for full details.

Write for Leytool hand tool booklet.



JIG & TOOL CO. LTD.

LEYTOOL WORKS . HIGH ROAD . LEYTON . LONDON . E.10 Phone: Leytonstone 5022-3-4

MINOR INDEXING ATTACHMENT



. . . Standard index plate of 12 divisions. Special plates up to 20 divisions. Supplied with collet mounting and interchangeable 5½in. table. Standard collets 1½in.-¾in. by 3½in. dia., specials on request. Can be locked in any position.

LARGER ATTACHMENT ALSO AVAILABLE.

W. H. MARLEY & CO. LIMITED NEW SOUTHGATE WORKS, 105 HIGH RD., LONDON, N.11
TELEPHONE: ENTerprise 5234 5578

Tool and signs

chine

TO. E.10

ACKWORTHIE

MODEL D.T.H.I. **FULLY GEARED** VERTICAL HYDRAULIC-PNEUMATIC FEED DRILLING MACHINE

Ackworthie's latest addition to their range of PRECISION-BUILT MACHINE TOOLS. Designed specifically for MULTI-DRILLING. INFINITELY VARIABLE TABLE FEED. POWERFULLY CONSTRUCTED, SIMPLE TO OPERATE, MINIMUM down time on settings. Number of

SPINDLES to requirements. Illustrated fitted with ACKWORTHIE 8 SPINDLE FULLY ADJUSTABLE UNIVERSAL JOINT DRIVE DRILLING HEAD.

ACKWORTHIE

JOHN

DALEHOUSE LANE · KENILWORTH

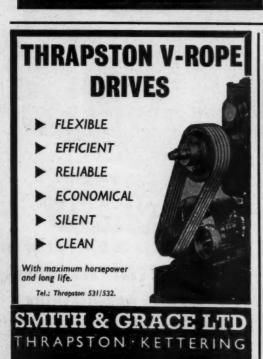
Send for your copy of 'Automation by Ackworthie/H' and consult our Technical Advisory Dept. on your Drilling and Tapping problems.

VARWICKSHIRE

Telephone: Kenilworth 1530 (P.B.X.)



SHARDLOW MICROMETERS LIMITED PETRE STREET - SHEFFIELD 4





1961

Finishing to micro-inches R.M.S. superlatively fast on tools and components

... demands
VANDIA
METAL AND RESIN BONDED

AVAILABLE IN A FULL RANGE OF SHAPES AND SIZES

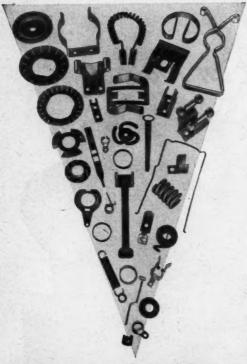
UNSURPASSED IN QUALITY AND PERFORMANCE

FULL PARTICULARS AND PRICES GLADLY SENT ON REQUEST

METAL AND RESIN BONDED
DIAMOND WHEELS
and HAND LAPS

S. L. VANIMOPPES LTD.

Head Office: 26-29 ST. CROSS STREET, HATTON GARDEN, LONDON, E.C.I Tel. Chancery 8093/4



Presswork and Springs of every type

IN ALL METALS TO THE FINEST LIMITS SPECIALISTS IN BERYLLIUM COPPER PROGRESSIVE PRESS TOOLS **MULTI SLIDE AND TRANSFER PRESSES** HIGH PRODUCTION DEEP DRAWING

Electro (Spark) Erosion for the Trade

Helical Tension, Torsion and Compression Springs and Wire Shapes from 40 S.W.G. (0.0048in.) to

FULLY A.I.D. AND A.R.B. APPROVED

SPRING STEEL

DUCTI

Factories Pressings: 784-788 HIGH ROAD, TOTTENHAM LONDON, N. 17 TEL: TOTTENHAM 7746/7 Coiled Springs: COMMERCE TRADING ESTATE, RAVEN ROAD SOUTH WOODFORD, E.IS



BALL, ROLLER. TAPER ROLLER & NEEDLE BEARINGS

IN METRIC SIZES



SOLE CONCESSIONNAIRES AND STOCKISTS FOR UNITED KINGDOM

Head Office: 72 Vicar Lane BRADFORD Telex 51243

Also at: 70 Foleshill Road, Coventry 61 St. Benedict's St., Korwich

Tel: 27108 Tel: 21795

Production Tapping and Threading

HAGEN & GOEBEL MACHINES

Hand or Pitch Controlled Feed, spindle reversal by opposed friction clutches, vertical head adjustment. Bench or floor models available, also an automatic tapping version.

Send for data: MODELS FROM 5/64" to 21"
TAPPING CAPACITY

ORTIMER ENGINEERING COLT



MORTIMER HOUSE, Acton Lane, London, N.W.10 Tel. ELGar 3834 N. R. P. 515/

TEE NUTS TEE BOLTS Good Deliveries. SIMILEX DRIGINAL MANUFACTURING CO., LTD., Winton Works, Wharf St., Sowerby Bridge. Telephone: HALIFAX 81928 NUFACTURERS

KIU KUS



Bath-dipped or brushed on, one COLD application removes all surface rust and combines with the rest, however deep seated, sealing off the pores of the metal with a protective phosphate plating. Requires no after rinse neutralising. Non-toxic, non-volatile, non-inflammable. Perfect base for paint, cellulose or enamel. \(\frac{1}{2}\), 1, 5 and 10 gal. sizes, also in Poly-Packs of 6 fl. oz. and 1 pint.



FOR RAPID RUST REMOVAL & POSITIVE PROTECTION



OTHER SPECTRA PRODUCTS

SPECTRA-COLOR Layout and Identification Fluid, in 2 grades with both in 13 colours.

SPECTRA-SPRAY Tool Room Blue—Spectra-Color Blue in speedy aerosol pack.

RID-O-GREASE, all purpose de-greasing fluid. SOLDAFLO, high efficiency soldering flux.

SPOT-LEAK, the new visual method of detecting leaks in equipment employing air or gases under pressure.

SPECTRA CHEMICALS LIMITED

Spectra Works, High Street, Caterham, Surrey. Telephone: Caterham 3182 & 2293



HEDGES REINFORCED PLASTICS LTD.

GLASS FIBRE REINFORCED PLASTIC MOULDINGS
MACHINE COVERS—SAFETY GUARDS
HOPPERS—CONTROL CABINETS
DUCTING—DOORS—OIL TANKS, ETC.

DALSTON GARDENS, STANMORE, MIDDX.

WORDSWORTH 6848



'murenco'

BOLTS & NUTS

Immediate delivery of any size from our very large stocks
FREE SET OF T-SLOT GAUGES & ILLUSTRATED

MURRAY'S (PRETORIA) ENGINEERING CO. LTD.

PRETORIA ROAD * ROMFORD * ESSEX

TEL: ROMFORD 42380





MACHINERY'S SMALL ADS
BRING BIG RESULTS

CLASSIFIED ADVERTISEMENTS

LINE (All type, except Situations Wanted) Col. width 12 in., 13 lines per inch, min. 4 lines, 1 line averages 6 words, 2/6 per line single insertion (series discounts on request). "SITUATIONS WANTED," 1/11 per line, min. 4 lines.

RATES: DISPLAY (with or without blocks) 62 6s. 0d. per inch single column and pro rata (series rates on request).

BOX Nos. 2/- extra. Classified advertisements can be accepted at London Office up to Wednesday preceding following Wednesday's

CONTRACT WORK

• • • DESIGNS

NOW!! SPARK EROSION TO THE TRADE

On Precision Swiss Eleroda Machine Reduce Press Tool costs CARBIDE-FORGING-EXTRUSION IMPACT EXTRUSION DIES

We also modify existing tools

PRESS TOOLS

JIGS-FIXTURES PROTOTYPE MACHINING

JIG BORING AND PRECISION GRINDING LANDEN (ENGINEERS) LTD.

la, Aubert Park, Highbury, London, N.5 Phone: CANonbury 1075

ENGINEERING

AND HANUFACTURERS

JIGS FIXTURES . GAUGES PRESS TOOLS FORM TOOLS AND SPECIAL MACHINES

A.I.D. Approved
Viking Works, London Rd.,
Romford, Essex. Tel: Standard 61991/3



ANGLO CAM DESIGN

CHURCH STREET, CROWTHORNE, BERKSHIRE

Telephone: Crawthorne 2834

We are specialists in the Design and Manufacture of Cams for Turret Type Single Spindle Automatics.

PRODUC



C.B.POWELL LTD PHONE: 71144



EQUIPMEN IST. JOSEPHS CLOSE SUSSEX HOVE

● ENGINEERING BUYERS NEED MACHINERY'S ANNUAL BUYERS' GUIDE



W.R.SOUTHWELL (DESIGNS) LTD 30 ST. DUNSTANS HILL, CHEAM SURREY 'Phone: FAIRLANDS 3617 & 7548

DESIGN & PLANNING

PRESS TOOLS JIGS & FIXTURES
SPECIAL PURPOSE M/CS DIECASTING MOULDS PLASTIC MOULDS PIPING, DUCTING, ETC

GEARS—PRECISION
AND INSTRUMENT MACHINE CUT
Max. capacity 12 D.P. 8in. dia.
Blanks surraed and cus. SETON CREAGHE ENGINEERING LTD.

TRADING ESTATE, PARK ROYAL ROAD, N.WIO A.I.D. 'Phone: ELGar 3356/7 A.R.B.

WE DESIGN

AND MANUFACTURE

PRESS TOOLS AND DO THE

All Drawing Undertaken Includ-

ing Press Tools, Jig and Fixture, Planning Mechanical and Checking, etc.—RINGFIELD LTD., 10, Molesey Road, Hersham, Walton-on-Thames, Surrey, Tel.: Walton-on-Thames 24603.

PRESS WORK

A.I.D. & A.R.B. APPROVED

NAISH BROS. & CO. LTD. 124, CHELTENHAM ROAD, BRISTOL. Tel.: 25532-3

• • GEARS

GEARS We are Specialists

Experienced Gear cutters at your service.
No need to lat a gear problem stump you.
Expert knowledge is on hand.
Rapid delivery from customer's own blanks.
All gears cut, or made complete to your requirements.
Trust your gear-cutting to us (over 30 years experience).
Every astisfaction assured.
Do send your enquiries, large or small, prompt attention given

F. M. IILLICH (GEARS) LTD.

OXGATE FARM WORKS
COLES GREEN ROAD CRICKLEWOOD, N.W.2

Telephone: GLAdatone 6322

SPIRALS 'SPURS WORMS & WHEELS BEVELS SPROCKETS CAPACITY LIST ON APPLICATION.





Gears Cut or Machined Complete. One off or production runs

F. W. BAGGETT & CO., I/TD., 8, Temple Street, Wolverhampton 25794.

GENERAL ENG'G. SERVICES ..

A.I.D. and A.R.B. Approved

HARDENING CO., LTD. DAVIS ROAD, CHESSINGTON, SURREY

> HEAT TREATMENT **SPECIALISTS** HARDENING OF EVERY DESCRIPTION AND SANDBLASTING Tel.: ELMBRIDGE 6556

INDUCTION HARDENING AND BRAZING

CYAMIDE HARDENING, PACK CARBURISING

PRECISION HEATING LTD. Island Farm Avenue, West Helesey, Surrey Phone: MOLesey 4231

CASTINGS

ECLIPSE FOUNDRY

& ENGINEERING CO. (DUDLEY) LTD. SEDGLEY ROAD WEST TIPTON . STAFFS.

GREY IRON ALUMINIUM FERROUS MAZAK

Send & Die

Immediate Capacity Available castings, non-ferrous, dia, shell moulded, sand, etc. Also machining and stove enameling.—MILLS ENGINEERING PRODUCTS, LTD., Barnet. Phone: Barnet 6748.

TOOL, CASE HARDENING, CARBURIZING • MARTEMPERING AND FLAME HARDENING. • GEARS A SPECIALITY • A.I.D. APP. ALAN KEIR LTD.,

NORTH ACTON ROAD, LONDON N.W. 10.

for PROTOTYPES

DESIGN & CONSTRUCTION OF SPECIAL MACHINERY

ALSO CONTRACT WORK, MEDIUM AND SMALL PRECISION MACHINING, GEAR CUTTING AND COMPLETE ASSEMBLIES

Telephone: CANonbury 4244 (4 lines).

Telegrams: WILMAKET, NORDO, LONDON

GENERAL HEAT TREATMENT

CASE HARDENING AND CYANIDE HARDENING ON PRODUCTION BASIS OR SINGLY SHOT BLASTING

CROYDON TOOL AND CASE HARDENING SPECIALISTS LIMITED

UNION ROAD . WEST CROYDON Tel: THORNTON HEATH 5222



(A.I.D. approved)

for PROTOTYPES AND PRODUCTION QUANTITIES

FINE PRECISION **ENGINEERING**

12, OVAL ROAD, LONDON, N.W.I. GULliver 2353 4085

ABBEY HEAT TREATMENTS LTD. PLAZA WORKS, HIGH STREET, MERTON, S.W.19
FOR ALL TYPES OF HEAT TREATMENT WE COLLECT-WE DELIVER A.LD. D.L

TELEPHONE: CHErrywood 2291 A.R.P.

Arm.

CASE HARDENING and **HEAT TREATMENT**

Quick Deliveries

BY OF FURNACES II SALT BATH FURNACES 6 o" DEEP AND M" WED

HEAT TREATMENT OF HIGH SPEED STEELS AND DIES BY CARBO-NEUTRAL PROCESS

ANNEALING AND CARBURIZE CYANIDE HARDENING AUSTEMPERING

ON ALD, LIST

IOLT BROS

(HALIFAX) LIMITED HOPE STREET, HALIFAX EST 1869 PHONE: HALIFAX 60361

PROTOTYPES & SPECIAL PURPOSE MACHINES
REPAIRS AND SALVAGE BY DEPOSITION
MACHINING, FORGING & FABRICATING

GEORGE MILLS (ENGINEERS) LTD. Tel.: Sydenham 5258 Beckenham, Kent.

PRECISION ENGINEERING

PRECISION GRINDING

NEWCOMBE & HASTINGS LTD. MARLBOROUGH YARD, MARLBOROUGH ROAD

HOLLOWAY, N. 19 TEL: ARC 4366

Stonebridge PLOUGHGRINDING Service 707 Tudor Estate, Abbey Road, Park Royal, London, N.W.10. ELG. 5858. GROUND BLANKS SUPPLIED.

Luton Engineering Pattern Co, are prepared to undertake the manufacture of all classes of wood and metal patterns, and accuracy and prompt delivery guaranteed.—Send your enquiries to 89A Princes Street, Laton. Phone: 681.

PROTOTYPE & PRODUCTION

BLECTHONIC WINNING, COIL WINNING THE PROPERTY AND A TRETTING SETOM CHEARCHE ENGINEERING LO. W. Trusting States, Park Shipul S.W. Lo. BLEAR 2006/7

Plough Grinding—Plate and Components—Ground Blanks supplied.— BRUNSWICK RNG. CO., 120, Ewell Road, Surbton, Surrey. ELMbridge 5872.

A.I.D.

COVENTRY GRINDERS LTD

AID, ARB Approved Phone 73344

Send us your enquiries for

GAUGES, FORM TOOLS, DIES, PROTOTYPE, COMPONENTS, MANDRELS, CRUSHERS, JIGS, GEAR CUTTING, OPTICAL FORM GRINDING, CENTRELESS, INTERNAL, EXTERNAL, SURFACE. ALL SIZES GROUND GAUGEPLATE IN STOCK

1 to 18in. WIDE 古 to Ilin.

18in, to 48in. LONG.

OF PRECISION

220 Bedford Avenue Slough, Bucks A.I.D. & A.R.B. **SLOUGH 22228**

CAPSTAN CAPACITY Available For WARD IA, 2A, 3A, Smart and Brown Life.

ELECTRO MECHANISMS LTD

Automatic Capacity Available on Index single spindle autos, up to 2‡in. dia.
—ARTHURS ENGINEERING, LTD., Hersham
Trading Estate, Molesey Road, Hersham, Surrey.
Phone: Waiton-on-Thames 21277.

Immediate Capacity Available on Single Spindle Automatics up to 14 in.—HARRADINE AUTOMATICS, Forge Works, Pleasant Place, Hersham, Surrey. 'Phone: W-08-7. 24914.

Automatic Work up to 11 in.
Immediate capacity available.

TRUE ENGINEERS, LAD., Wharf Lane, Bourne End, Bucks. 'Phone 1916.

TREATMENT HEAT PEOPLE OF LONDON G.R.M. Heat Treatments Ltd., Coronation Rd., Park Royal, N.W.10

MACHINING

AUTO TURNED PARTS

FINETOLERANCES, MAX. DIA. HIR. INDEX SS & GRIDLEY MULTIAUTOS THREAD CHASING MANUFACT'RS ROLLER BOX TOOL HOLDERS BENTON ENGINEERING CO., LTD. Tenbridge Read, Harold Hill, Essex. Ingrebeurne 43864/5.

Auto and Capstan Capacity avilable up to 24in. dia. Milling, Drilling, etc. Small well equipped workshop offers personal attention and prompt delivery.—
C.D.F. MACHINED PRODUCTS, 26, Park Street, Hatfield, Herts. Hatfield 2159.

-THE-ELGar 5057/8

Immediate Capacity Available on single spindle Automatics up to 1in. dia.—M & C. AUTOMATICS, Wood Street, Guildford, Surrey. Telephone: Normandy 3240.



Immediate Capacity Available for Vertical Boring up to 13ft. diameter C. E. HARPER AIRCRAFT CO., LAD., Exeter Airport, Exeter





When answering advertisements kindly mention MACHINERY.

contrast plant introduction the personal

CAM cutting

Experimental Camshafts and Models.

If you are interested in having your cams redesigned, to give increased speeds, we have a technical leaflet on this subject which may be of interest to your Design Department.

> zephyr cams Itd.

Euston 7624/5

24/32 Euston Buildings, Gower St., N.W.I

CUTTING TOOLS AND PRECISION GRINDING



TECHNITOOLS LIMITED GI, WINDHILL ROAD, WEST CROYDON, SURREY TELEPHONE AND INLAND TELEGRAMS: THORNTON HEATH 475

Spur Gear and Sprocket Cutting from blanks supplied or machined complete. Phone: EUSton 1354.

TURNER BROS., 10. Pratt Mews, Camden Town, N.W.1.

Automatic Capacity Immediately available. Swiss type machines up to fln. dia.—E. V. IRONS. Clovelly Works. 272, Acton Lane, Chiswick, W.4. CHiswick 1007

Precision Turned Parts, Auto tin., Capstan 2in. Milling, Grinding, Heat Treatment, etc. A.I.D., A.R.B

S.M.E. LTD., Steyning, Sussex 'Phone: Steyning 2228.

Thread - Grinding.
SCREW THREADING TOOLS, Ltd.,
226, Middlewood Road,
Sheffield, 6.

Automatic Capacity Available — Index single spindle autos, up to 1 in. dia.
—PRESS & PRODUCTION MACHINE
TOOLS, LT., 97a, High Street, Teddington.
Tel.: Lock 4032.

YON CENTRELESS GRINDING Up to No. 2 Cincinnati size

and CYLINDRICAL GRINDING

External up to 12 in dia by 36 in Internal up to 71in by 81 in

A MARSDEN & SHIERS LIMITED A I DAVIS ROAD . CHESSINGTON . SURREY R

Telephone: Elmbridge 5333 (3 lines)

Immediate Grinding Capacity available. High Precision work on all materials. Tungsten Carbide Grinding a speciality. Manufacturers of "Special" Tipped Tools. Middless. Tel.: Uzbridge 33428.

THE NEW ZIPPER CO., IATO., Altona Way, Buckingham Avenue, 8 Trading Estate, Bucks. Tel.: 25612.

Thread Milling for the Trade up to 6in. O.D. and 5in. I.D. Any thread any quantity. Keen prices for long runs. Satisfaction guaranteed.

Centreless Grinding Capacity. Infeed Plunge 1:10. to 4in.—CHISWIUK ENG'G, Ltd., Pluckington Place, Southall, Middx. Tel.: Southall 2247.

Small Manufacturer With Fully any quantity. Keen prices for long runs, satisfaction guaranteed.

Satisfaction guaranteed.

UNICORN PRODUCTS, Ltd., 119-121, Stanstead Road, Forest Hill, London, S.E.25. Telephone: Forest Hill 7688 (3 lines). Citrton House, Euston Road, N.W.1.

MACHINING CAPACITY ... phone: KIN 6112

PRECISION & GENERAL ENGINEERING.
CAPSTANS, TURRET LATHES, AUTOS, LATHES, HILL DRIVES, BORERS, ALL GRINDING, FULL MACHINE SHOP SERVICE COMPONENT & ASSEMBLY PRODUCTION JIGS, TOOLS, FIXTURES, PRESS TOOLS

W.G. MARSDEN ENG. LTD.

UNRIVALLED EXPERIENCE -TOP QUALITY - KEEN PRICES 30 FIFE ROAD, KINGSTON - ON - THAMES, SURREY

PRECISION TURNED PARTS

G.I. and A.R.B. APPROVED
O & CAPSTAN QUANTITIES

AYLESBURY TURNED PARTS (True Screws) Limited

Britannia St., AYLESBURY, Bucks.
Telephone: AYLESBURY 2424 (3 lines)

Automatic and Capstan Capacity Available up to 2in. dia.— WILLIS ENGINEERING, 65, High Street, Hampton Hill, Middlesex. Molesey 4278.

Automatic Capacity Available on ENGINEERING COMPANY, Bridge Works, Iver Lane, Cowley, Middlesex. Telephone Uxbridge 38889.

Planing Capacity, Heavy or Light Turning up to 5ft. diameter. Special machines to customers' design.

F. ATKINSON & SONS, (LONDON), LZD., 65, King's Cross Road, W.C.1. Terminus 4050

Capacity Turning, Capstan milling, drilling, de and tool making.

—MILS ENGINEERING PRODUCTS, LTD., Barnet. Tel.: Baknet 6744.

Automatic Capacity Available.

Index single spindle Autos. up to 24in.
dlameter. Centreless Grinding Capacity in.
to 6in. diameter.

JAN PRECISION SCREWS, 829 Spur Road, Feltham, Middler Telephone : Feltham 4282/3

Multi-spindle and Single-spindle Auto Turning up to 2in. bar capacity, capstan turning from the bar up to 2in. dia. chunck work up to 14in. dia., thread milling, milling, shaping, drilling, etc., capacity available. Any tolerance and quantity. Satisfaction absolutely guaranteed.—UNICOEN PEO-DUCTS. Ltd., 119-121, Stanstad Road, Forest Hill, S.E.23. "Phone: FORest Hill 7888 48 lines).

FINE LIMIT GRINDING
MILLING, TURNING, DRILLING.
Complete Service Offered.

SETON CREAGHE ENGINEERING LTD. Trading Estate, Park Royal Read, N.W. 10 A.I.D. ELGar 3356/7 A.R.S.

Automatic Capacity Available, Index Autos, up to 2 in. diameter. Chucking up to 5tn.

JAMES HARRINGTON, Magda Works, Walton-on-Thames. Tel.: 26000 & 25614.

Capetan Capacity Immediately
Available, 8 BA-1 in. Steel or Brass.
Large stocks of raw materials

SACRON, LTD., 7. Chiswick High Road, W.4. Tel. CHIswick 3595

High Precision Grinding of Accurate profile grinding and progression tools a speciality.—S.T. Ltr., 22-26, Upper Mulgrave Road, Cheam, Surrey. "Phone Vigilant 0074/S.

Capstan Capacity Immediately available 10 BA to 1 in R.M.S. Stainies, 87am, etc. All materials in stock.—CHISWICK ENG., L/TD. Pluckington Place, Southall, Middlesez. Tel. Southall 2247.

CENTRELESS GRINDING SPECIALISTS BAR GRINDING

HIN. TO Sin. DIA. UP TO 15ft. LONG all types of infeed, through and plunge

A.I.D IMMEDIATE CAPACITY ON CAPSTAN, MILLING APPROVED CENTRE LATHES, AUTO AND ALL TYPES OF GRINDING

REDGAR ENGINEERING CO. LTD. Tel POPESGROVE 6157 & 7088

8 STATION YARD GROSVENOR RD TWICKENHAM MIDDX

AIRCRAFT UNIT ENGINEERING CO.

A.I.D., A.R.B. & A.R.B. LIMITED DESIGN APPROVAL HAVE GRINDING CAPACITY

UNIVERSAL, PLAIN, CYLINDRICAL 86in, by 15in, dia. **CENTRELESS**

18-19, Greenhill Parade, Great North Road, New Barnet, Herts. Telephone: BARnet 6471 & 7499

CHATER-LEA MFG. Co. Ltd. EST ISSO

INVITE ENQUIRIES FOR BROACHING, THREAD ROLLING AND CENTRELESS GRINDING. WE REGRET THAT WE HAVE NO CAPACITY AVAILABLE AT THE MOMENT FOR OTHER TYPES OF MACHINING.

NEW ICKNIELD WAY, LETCHWORTH, HERTS.

R.B.A.A.I,D. I.F.V. APPROVED

TEL: LETCHWORTH 400

Gear Cutting, Auto Turret, Capetan and Centre Lathe Turning, Milling, Planing, Hardening and Grinding, Profile Cutting and Welding.

SMITH & NETHERWOOD.

LTD.
Tanyard Road, Quarmby,
HUDDERSFIELD.
bone: MILNSBRIDGE 1866.

WE MAKE TANKS, FRAMES, DUSTS, INSTRUMENT PANELS AND CHIMMEYS

Let us have your enquiries for welded fabrications large or small. And we can press 200 Tons, guillotine bend and cylindrical roll ‡in. plate.

SHELMERDINE & MULLEY LIMITED EDGWARE ROAD, CRICKLEWOOD N.W.2.
Tel: GLAdstone 7677-8.

E. R. LATTIMER LTD AID & ARB APPROVED

Offer complete Service for PRECISION PROFILE MILLING, JIG BORING STREET

CENTRELESS, SURFACE AND UNIVERSAL GRINDING LIGHT TO HEDIUM COMPONENT MANUFACTURE TOOL DESIGN & MANUFACTURE

SHALL ASSEMBLIES, DIE & HOULD HANUFACTURE SHALL PRESSURE DIE CASTING IN MAZAK ALLOY TO 85 1004 SUPER PRECISION HYDRAULIC COMPONENTS AND ASSEMBLIES FOR WHICH WE HAVE HYDRAULIC TESTING EQUIPMENT

SHAKESPEARE SOUTHPORT Phone: 57696/7



THE FIRM WITH HALF A DOZEN JIG BORERS RESS TOOLS etc. for

HIGH SPEED SERVICE TOOL CO. LTD. is Read, Surbiton, Surroy. Elmbridge 1135-6-7. 14 HOUR PLOUGH GRINDING SERVICE.

Spinning A. MAISNER & Co. Lad., 12, Long Street, E.2. Sho. 6463.

Pressings in all Metals Up To 90 tons. Press tools manufactured to our own toolroom. Light assemblies. Domestic Electrical and Mechanical. All finishes. A.I.D. and A.R.B. approved. Advice and estimates given free. Inquiries to:—

METAL COMPONENTS, Ltd., Dolphin Road, Shoreham-by-Sea, Sussex, 'Phone: Shoreham-by-Sea 2224/5.

RELIABLE SERVICE . COMPETITIVE PRICES . A.I.D. APPROVED

Immediate Capacity Available on 500 ton Bliss Toggle Press. Bed size 7ft. 0in. × 5ft. 0in. Daylight 5ft. 0in. Draw depth 12 in.

C. E. HARPER AIRCRAFT CO., Ltd., Exeter Airport, Exeter.



PRESS WORK

INCLUDING DEEP DRAWING, WELDING AND SUB-ASSEMBLY to any tolerance, shape or quantity

ECONOMIC STAMPINGS LTD., DISRAELI ST. LEICESTER Tol: 32233



MAIDENHEAD BERKS

Pressings on auto or hand fed presses. Immediate capacity up to 40 tons. Production from our, or customer's tooling. A.I.D. approved.—Summersby Road, Highgate, N.S. TUDor 9851.

Pressings and Stampings, Ltd., Presework up to 130 tons. Double action deep drawing guillotine 8ft. by 10 s.w.g. Spot welding. Assembly. Toolmaking and electro-plating.—Phone: Ealing 8667-8.

Press Productions

PRESS TOOLS AND PRESS WORK

ALL PROTOTYPE REQUIREMENTS RESIN & METAL PATTERN MAKERS MYLON MACHINING

Mostyn Engineering Co.

INVERNESS WORKS, Inverness Road, Southall Middx. TEL SOU 6785.

SUB-MINIATURE PRESSINGS and multi-stage precision press work in all materials PROMPT DELIVERIES G. A. PRECISION PRODUCTS LTD.

No. 2 Factory Darkes Lan Potters Bar, Middlesex Potters Ber 6895.



C

LOOKTO

TOOLMAKERS Barr St., BIRMINGHAM 19.

Literature on request

Sole Manufacturers of: AKALOY CARBIDE TOOLS & TIPS

PRESS TOOLS - JIGS-FIXTURES -

Tel: Northern 8421 (4 lines)

Macdowall



ROMFORD 61981

MACDOWALL EQUIPMENT COMPANY LIMITED HORTH STREET ROMFORD, ESSEX

Tungsten Tool Carbide Manufacturers of standard and special form tools in high speed steel and tungsten carbide. Our range include reamers, outers, workers blades and wear-resistant parts. Carbide supplied to customers' specification and express service given for emergency tooling

DIAGRIT GRINDING CO., Ltd., Station Road, Staplehurst, Tonbridge, Kent. 'Phone: Staplehurst 449.

Press Tools, Press Work, Capstan Turning and General Machining. Components manufactured and assembled to specification.—L. PERSON & SON, 68, Shaftsbury Street, London, N.1. CLE. 7139.

PACKING AND SHIPPING

R. & J. PARK, LTD., Dominion Works, Chiswick, England, Export packers, shippers, and forwarding agents, specialists in packing heavy machinery.

ANGEL PRESS TOOL & Prod. Co. Ltd.

MULTI STAGE & COMPOUND TOOL SPECIALISTS

Wiedeman Punches & Dies Jig Boring, Jig & Diaform Grinding Punch Shaping, Jigs & Fixtures

410, ST. JOHN STREET LONDON E.C.I. TERminus 5355 A.I.D. Appr.



PHOTOGRAPHY

Miles & Kaye, Ltd., 102, Southampton Row, London, W.C.1. Holborn 6858. Specialists in commercial and industrial photography for over 60 years. All branches of photographic work undertaken.

Photographs by MACHINERY act the standard in engineering publicity.
Our studio is one of the best equipped in the country. Ideal for really good photography of tools, attachments and portable equipment. Mobile units available for taking photographs in black and white or in natural colour in your own or your customers' works. Specimens of the property of the

FAST CUTTING-ECONOMICAL ASK YOUR TOOL DEALER FOR "DING-DONG"

Send for Samples. Test them in your own works - free.

MANUFACTURED BY: CHARLES BAYNES LIMITED, KNUZDENBROOK, BLACKBURN, LANCASHIRE.

SPECIALITIES

TAPERLOCK & TRILOCK GAUGE HANDLES

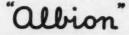
Engraving Service

& BLANKS Complying to B.S. 1044

Handles produced from aluminium material, anodised in various colours. Special length handles for deep bores. Blanks manufactured in cast steel hardened throughout, tapers ground to size.



BRILHART LTD . HATFIELD . DONCASTER . Tel: Stainforth 595



INDUSTRIAL COUNTING INSTRUMENTS & MEASURING MACHINES



Ratchet and Revolution Counters of all descriptions. A Catalogue or a visit by our technical representative on your request.



"INSTRUMENT DIVISION" B. & F. CARTER & CO. LTD. ALBION WORKS, BOLTON 19, ENGLAND TEL: BOLTON 23344 ALL LINES **GRAMS: BRAIDERS, BOLTON**



Machine Engraved Feed Dials,
Scales, Mould Tools, Nameplates, Labels,
etc., in Metal and Plastic. Excellent delivery.
O. H. KAMPF & CO., 15s., Market Square,
Crewkerne, Somerset. 'Phone: Crewkerne 709.

17 ME RECORDER SUPPLY &
MAINTENANCE CO., 17D.,
17 Mount Tender Street, London, S.E.1.





THE WORLD'S LARGEST SELECTION OF BRITISH, AMERICAN AND CONTINENTAL BEARINGS IN ALL TYPES AND SIZES IMMEDIATE DELIVERY FROM STOCK KEENEST PRICES

5 9 2 1 FULHAM ONE RENOWN 6174 (Ext. 24) ROAD PHONE TELEX 23453

LONDON CABLES LONDON Kingston Branch: 88 LONDON ROAD, KINGSTON Phone KINGSTON 6755 & 4142

Apr

purposes.
For particulars and prices apply:—
O.K. TRADING (B'HAM FACTORS) LTD.
78-84, MOAT LANE, B'HAM 26
STEchford 4351/2 P.B.X.

H.S.S. GROUND FORM

THREAD MILLING HOBS
 ALSO SPECIAL TAPS

PHONE: 2941 KEIGHLEY
PERCY C. HOLMES (ENGS) LTD.
MARKET ST., KEIGHLEY, YORKS



Aniversal

Sall Searing Co.

111-115 Hammersmith
Grove, London, W.6
FACTORS
MANUFACTURERS

Phone: Grams: "Universal Bearing Riverside 3261-2-3-4 Hammersmith"

ANNOUNCEMENTS

•WORK TO PLACE•

Sub-Contract. Well Connected Technical Representative seeks first-class firm to undertake 2/3,000 hours' work per month. Retainer and small commission.—BOX C757, MCCHINERY, Clifton House, Euston Road, N.W.I.

Large Engineering Company in London wishes to sub-contract work in the following capacities: Medium Capacita, Turret Lashes, Vertical and Horizontal Boring, Medium and Large Planing, Milling, Radial Drilling, Grinding, Centro Lathes, etc.—Please send particulars of plant to BOX C715, MACHINERY, Ciltion House, Euston Road, N.W.1.

Wanted, Gearbox Manufacturing
Capacity. Prototype precision reduction
gearboxes transmitting 200 b.h.p. followed by
small production quantity—BOX C786,
MACHINERY, Clifton House, Euston Road,
N.W.1.

BUSINESS FOR SALE

Small Auto Shop Complete, have C.V.A. and B.S.A. machines together with press tools and moulding tools, which go to manufacturing our own products which we market, as well as component manufacturing for outside one of the special properties of the special product of the special man. It is suffer to provide the special product of the special p

Light Precision Engineering
Business, on the South Coast, Modern
building, well equipped, new plant. Approved,
Unlimited work available. A good opportunity
for a first class precision engineer. Plant and
equipment \$5,000. Freehold property \$5,000.
Could be mortgased.—For further particulars
write BOX C783, MACHINEEY, Clifton House
Euston Road, X.W.I.

PATENTS-TRADE MARKS

The Proprietors of British Patent No. 787,144 for "A Rotary Drier, Especially for Granular Substances," desire to enter into negotiations with a firm or firms for the sale of the patent or for the grant of licences thereunder.—Further particulars may be obtained from Marks & Clerk, 57 and 58, Lincoln's Inn Fields, London, W.C.2.

MATERIALS FOR SALE

Storage Bins, 18in. \times 10in. \times 5in. deep 3a. Pressed Steel Shelves 4ft. 64in. \times 94in. \times 16 gauge 2a. 5d. Strong Storage Racks 15ft. 6in. \times 4ft. 6in. \times 6ft. or 12ft. high, good condition.—LOWTON METALS. L7D. Sandy Lane, Lowton St. Mary's, Leigh 71441/2.

MATERIALS WANTED

£200,000

NEW BALL & ROLLER

BEARINGS OF ALL TYPES & SIZES

BY BRITAINS BIGGEST BUYERS
CLAUDE RYE BEARINGS

895-921 FULHAM RD. LONDON SW6

PLANT WANTED

Longford Machine Tool Co., Ltd., Longford Road, Coventry, will pay good prices for any type of machine tool which is in good condition, and is of first class make. Only machines motorised 400/8750 will be considered. —Write or 'phone Coventry 87481/2.

Wanted, Brown & Sharpe and C.V.A.8 Single Spindle Automatic.— MELBOURNE ENGINEERING CO., LTD., Melbourne, Derbyshire. Phone: Melbourne 232.

Wanted. 1∄in. 5-spindle Wickman Har Machine.—BOX C674, N.W.1. Clifton House, Euston Road,

CENTAUR TOOL WORKS,
Birmingham 18, pay best prices for good
modern secondhand Machine Tools by first-class
makers. Write or 'phone and our representative
will call.—'Phone: EDGBASTON 1118 and 1119.

Harry Kirk Will Purchase modern quality machine tools for each whole plants or individual items. Full details

HARRY KIRK ENGINEERING, LTD., Machine Tool Division, Brandon Rosd Works, Brandon Rosd, Coventry, Telephone: Walsgrave-on-Sowe 2258/6.

Power Presses, Power Guillotines, Sheet Metal Machinery, urgently required.—STANCROFT, LIMITED, Lancaster St., Birmingham 4. Aston Cross 3741 or 2235.

Wickman 1 in. Multi Spindle
Bar Auto, 5 or 6 spindle, also 1 in. 2 in.
5 spindle with tooling. Good cond.—Particulare
and price to BOX C788, MACHINERY, Clifton
House, Euston Road, N.W.J.

B.G. MACHINERY, LTD.,
Montgomery Street, Sparkbrook,
Birmingham, 11, will pay good prices for
Machine Tools of first-class make and in good
condition.—'Phone: ViCtoria 2351/9.

WE ARE SEEKING GOOD CLASS
USED MACHINES AT THE
PRESENT TIME FOR WHICH WE
WILL PAY ATTRACTIVE PRICES

TATE

TATE MACHINE TOOL CO. LTD.
348-354, KENSINGTON HIGH STREET
LONDON, WIA: WESTERN 7031 (5 lines)
TELEGRAPHIC: TATE TOOLS, LONDON

Classified Advertisements (PLANT WANTED, contd



WE ARE KEEN BUYERS OF GOOD MODERN MACHINE TOOLS. INSPECTION WILL BE ARRANGED AT ONCE.

M. C. LAYTON LTD.

Abbey Wharf, MOUNT PLEASANT ALPERTON, MIDDLESEX

Telephone: WEMbley 9641-8

kend



We offer generous prices for your plant or sceept in part exchange for modern equipment

(MACHINE TOOLS)

48, HIGH STREET, EDGWARE

Telephone: EDGware 4488 Midland 5593 - Birmingham

WANTED

Good Class Used **MACHINE TOOLS**

Write or phone

STANCROFT LTD. BEDWORTH ROAD,

WHETHER BUYING OR SELLING **USED MACHINE TOOLS** COVENTRY K.E.N.T. MACHINERY & ENG. CO.

Telephone: Coventry 88072

SURPLUS MACHINE TOOLS REQUIRED

Datchelor Place Mews, London, S.E.5. Telephone; ROD 4149.

OFFER YOUR MACHINES TO

J. E. RAISTRICK LTD.

POYLE TRADING ESTATE COLNBROOK, SLOUGH, BUCKS.

TEL: COLNBROOK 2421

Machine Tools, Power Presses and Sheet Metal Machinery. Single machine or complete plant purchased. Immediate Inspection.—ALBERT EDWARDS (MACHINERY), LTD., 79/89, Pentonville Road, London, M.).

External Grinding Machine, 24in. swing, 18in. minimum between centres. Heavy duty. Must be in first class condition.—HENRY WILLIAMS, LTD., Dar-

WANTED GOOD MACHINE TOOLS

Offer your Surplus Tools to us. We pay a good price.

M. WARD

(MACHINE TOOLS) LTD. I, KILBURN HIGH ROAD, LONDON, N.W.6.

Telephone: MAIDA VALE 1195-96.

Telegrams: Emwarneer, Kil., London. One minute from Kilburn Park Station, Bakerloo Railway.

2 m

Selling Machine Tools?



SPECIAL REQUIREMENTS

HEAVY DUTY MACHINES

GATE MACHINERY CO.LTD

172-178 Victoria Road, Acton, London, W.I

Telex: 21111 Tel: Acorn 8881/2 (7 lines)

Wanted. Pratt & Whitney or equal Riffing machine and deep hole drilling machine for producing 0.22 Riffe barrels.

Direct to GIMBEL, 129, Avenida Amsterdam, Mexico D.F., Mexico. Copy to NIXON, c/o

MACHINE TOOLS . PRESSES . PLATE & SHEET METAL WORKING MACHINERY . TIN BOX MAKING MACHINERY . WOODWORKING MACHINERY

7.J. Edwards Ltd

Outright purchase or in part exchange

EDWARDS HOUSE, 359-361, EUSTON RD., LONDON, N.W.I Telephone: Euston 5000 | Telex 24264 41, WATER STREET, BIRMINGHAM 3 Telephone CENtral 7606-8

Api

WANTED

Cincinnati 6 Spindle Hydrotel Milling Machine

IN GOOD CONDITION

OR A MACHINE WITH SIMILAR CHARACTERISTICS

Brief details and price to

BOX C 779, MACHINERY,

Clifton House, Euston Road, N.W.I

High Prices Paid for
GOOD QUALITY USED
CONTINENTAL
Machine Tools

Bex C671, MACHINERY, Clifton House, Euston Road, N.W.I

WANTED MODERN MACHINE TOOLS

We pay cash for single machines or complete plants

SEND US DETAILS

SOUTHERN ENGINEERING AND MACHINERY CO. CONNAUGHT BUILDINGS, TANNERS BROOK, MILLBROOK,

SOUTHAMPTON
Telephone: Southampton 73101/2/3

WANTED

New or not more than Three Years Old R\$2 Pfauter Hobber Max. dia. 42in. Spurs, wormwheels with crossfeed head.

EDWIN MILLEN & SONS LTD. 70 CLERKERWELL BOAD, LONDON, E.G.1 Tel.: CLE. 6064 & 3602

Wanted, Mandrel Support
Steady for Archdale 28in. × 30in. Horisonial Mill (Vee Shaped will do).—BOX C76.
MACHINERY, Clifton House, Euston Road,
N.W.1.



A. LAWRENCE & CO. (MACHINE TOOLS) LTD.

will be pleased to purchase your surplus Modern Machine Tools either on a cash or part exchange basis. Ask our representative to call and inspect.

Welsh Harp, Edgware Road, London, N.W.2

Telephone: GLAdstone 0033

Wanted Urgently

Late Type Machine Tools
Best Prices are offered for
latest types of Machine Tools.
Send us details of what you
have and our representative
will call to inspect.

J. B. MACHINE TOOL CO. LTD. 312 BRADFORD ST., BIRMINGHAM 5 Telephone: MIDIand 4375



GOOD (LASS MACHINE TOOLS POWER PRESSES & SHEET METAL MACHINER)

EDWIN MILLEN & SONS LTD.

70 Clerkenwell Road, London E.C., I

'Phone: CLErkenwell 6064

WANTED

All types of modern

MACHINE

Chipping Sodbury 3311

NEWMAN INDUSTRIES LIMITED
YATE BRISTOL

PLANT FOR SALE

HENRY BUTCHER & CO.

• SALE AND VALUATION OF FACTORIES, PLANT AND MACHINERY • 73 CHANCERY LANE, LONDON, W.C.2

TEL .: HOLBORN 8411 (8 lines) GRAMS: PENETRANCY, HOLB., LONDON

CRITERION SURFACE PLATES

List Less 20%
Price List available
WM. HURLOCK JNR. LTD. (Estab. 1904)
5-7 Kingston Hill, Kingston-on-Thames
KIN 4526-7-8

New Lathe Chucks at Bargain prices, Pratt. Taylor, etc., 3-law and 4-law, 5in. to 26in.—List from EUCO TOOIS, 44, Loudon Road, Kingston, Surrey. 'Phone: Kin, 9029.

Stainless Steel Containers With lids, 6 gallon capacity, 75s.—THOS. FOULKES, Lansdowne Road, London, E.11.

Newall No. 1 Jig Borer—Very little used—with temperature controlled sectional housings.—SCOTT ENGINEERING (BOURNEMOUTH), LTD., 68, Old Wareham Road, Parkstone Poole, Dorset. Parkstone 4455/6.

Lo Swing Automatic Lathe.

Model R, capacity 164in, dia. × 32ir,
between centres. Air operated headstock and tailstock. Complete with standard electrics
440v. 3 phase. In good working condition,
Price 2800 O.N.O.—HENRY WILLIAMS, LTD.,
Darlington.

Richmond Horizontal Milling Machine, Type O3. Table 38 × 9, 440 volts, vertical head, 195 lb.—NOTTINGHAM 271437.

The "Coxeter" Revolving
Centre from 70s. All sizes from stock.—
REVOLVING CENTRES, LTD., Oxford.

ACME GRIDLEY R.A. 1in.

Six Spindle Universal Threading fourth position, fifth position independent. P.O. slide, Serial No. 23000, also him. Six Spindle ACME GRIDLEYS.

GEORGE TUSTIN LTD. New Street, West Bromwich.

7 in. Capacity 6-spindle B.S.A.
8 Acme Gridley Bar Automatic. Tooling.
Collets, Feeders, Drilling Spindle. Inspection
London area. Delivered in 1947, reconditioned
in 1955 by reputable company.—Telephone
Mr. GANDER. Brie

11G Reed Prentice Diecasting
Machine. In excellent condition.—For
further details write to BOX C623, MACHINERY,
Clifton House, Euston Road, N.W.1.

Swift Sentinel Lathe. Type 10SP 20in. swing × 6ft. between centres. Excellent condition.—BOX C673, MACHINERY, Clifton House, Euston Road, N.W.1.

WIDDOWSONS

NEW 'TEST' No. 2 UNIVERSAL MILLING MACHINE

Table size:-

Complete with Dividing Head and Vertical Milling Attachment.

IMMEDIATE DELIVERY

HERBERT No. 4 CAPSTAN LATHE—BAR FEED

'Flamard' Bed. Speeds up to 750 r.p.m.

Arranged for Screwcutting.

THREE MACHINES AVAILABLE

NEW SICMATIC SEMI AUTOMATIC, HYDRAULIC PROFILING AND COPY TURNING

Capacity 14in. dia. by 27in.

Auto Re-cycling. 6 depths of cut.

DELIVERY 14 DAYS

CRAIG & DONALD DOUBLE ENDED STEEL PLATE FRAME GEARED PUNCHING, SHEARING AND CROPPING MACHINE

Capacity: Iin. Shearing, I\forall in. Punching through Iin. Plate. 7in. by 7in. angles. 2\forall in. Bars.

HERBERT WIDDOWSON & SONS LIMITED

Canal Street Works, Nottingham • Telephone: 51891 (4 lines)

MEMBER OF B.A.M.T.M.

Apr

oft

Cl

RING BELLS for machine tools

A Good Number of High-class Machine Tools always in stock.—M. ELLISON (SALFORD), LTD., Cook Street, off Chapel Street, Salford, 3, Lancs.

TRY LIBERTY 6644 FOR YOUR MACHINES

Our stock includes Myford MGI2 Grinders, Eagle Surface Grinders, Myford Lathes, Boxford AUD 4jin. Lathes, Willson 6jin. Lathes, Pacera Drilling Machines from jin. to 1jin. capacity, Startrite Bandsaws, Kennedy, Rapidor and Q. & S. Hacksaw Machines, Center Milling Machines, 18in. Alba Shapers, Vices and Rosary Tables of all types.

LIBERTY ENGINEERING SUPPLIES

Colliers Wood High Street, S.W.19

Churchill 10in. × 14in, Universal Grinding Machine (1944). With steadies, etc. Reconditioned.—BOX C549, Machinery, Clifton House, Euston Road, N.W.1.

Landis 12in. × 36in. External/ Internal Grinding Machine with Excello Internal Spindle. Chucks and Steadles. Good condition. If interested telephone Mr. GANDER, Byfleet 43252.

6-spindle 1\(\frac{1}{2}\)in. Dia. Bar Capacity
Greenlee Automatic Machine. Excellent
condition, well equipped with Tools and Attachments.—For details write to BOX (2551,
MACHINERY, Clifton House, Euston Road,
N.W.1.

A Comprehensive Selection of Modern Machine Tools Always in stock

WM. PARTINGTON LTD.
Trafford Park Rd.
Trafford Park
Manchester 17

TRAFFORD PARK 0332

Snow Hydraulic Surface Grinder, Model P24. Capacity 24in. × 8in. Motorised.—WILCOX & CO., Barr Street, Birmingham, 19. NORthern 1234/5.

Wotan Shaper, 20in. Stroke, 400/3/50. £200.—A. McNAMARA & CO., LTD., New Line, Bacup, Lancs. 'Phone: Bacup 946.

Peterman . P7R Sliding Head, 10mm. automatic, combination attachment, barfeed, gears, etc. Worked 4 weeks only, perfect.—C. L. THOMAS LTD., Stirling Road, Solibuill. Tel.: 3075 6.

Choose from

HUNDREDS of

at the

FIE MACHINE CENTRE

Islington Park Street, London N.1. (on the A1, near Highbury Corner)

> Cash or monthly account, hire purchase, or by the FJE Machine Hire Plan

F. J. EDWARDS LIMITED 359-361 Euston Rd. London N.W.1



MILLING MACHINES

HELLER Single Horizontal Spindle Double
Housing for open sided) Plano Slab Miller.
Table W.S. 37t. 34in. × 16ft. 5in.—5 tee slots.
No. 2 MAXIMILLER, Vertical, Table W.S.
58in. × 12in.
MAMMUT Universal. Table 53in. × 114in.
DENBIGH C.4 Horizontal. Table W.S. 46in. ×

KEMICANTH No. 2G Universal. Table 45in, ×
RICHMOND 038D Universal. Table W.S.
38in. × 9in.
DENBIGH C.2 Horizontal. Table W.S. 34in. ×
10in.
ARCHOALE Plain Horizontal. Table 29in. ×
84in.

8 in. All Machines Motorised for 400/440 volts, 3 phase, 50 cycles.

INSPECTION :-

THO! W. WARD LTD.

THAMES ROAD, SILVERTOWN, LONDON, E.16.

Remember - WARDS might have it!

FOR SALE

LEES-BRADNER Hobber Model 7HD. 8in. by 20in. Single Spindle.
LEES-BRADNER Hobber Model 7A. 8in. by 20in. Eight Spindle.
LEES-BRADNER Hobber Model 7HD. 8in. by 20in. Six Spindle.
LEES-BRADNER Hobber Model 7HD. 8in. by 20in. Four Spindle.
LEES-BRADNER Hobber Model 12HD. 12in. by 20in.
LEES-BRADNER Hobber Model 12.
LEES-BRADNER Hobber Model R. Heavy Duty. 16in. by 12in.
LEES-BRADNER Thread Miller. 24in. swing by 144in. between Centres.
LEES-BRADNER Model H.H. Heavy Duty Spline Hobber. 16in. by 144in.

BOX C748, MACHINERY, Clifton House, Euston Road, N.W.I Special Offer of New Heavy Duty Revolving Centres for Turret/Capstan Lathes, diameter of head 3ln. × 2in. wide, with lin. dia. shanks only overall 5in., at 77s. 6d. each, post paid.—ACORNTOOLS, 610-014, High Road, Chiswick, W.4. CHI. 3416.

Broadbent 84in. × 8ft. A.G.H-8.8 & S.C. Lathe with taper turning-motorised 440/3/50, good condition. Below. Precimax Cylindrical Grinder, 6 × 24, Model MrJ. Hydraulic, motorised, 440/3/50, overhaude 4-spindle Drilling and Tapping Archdale 4-spindle Drilling and Tapping Machine, Independent 4-speed motors and reverse, table 48in. × 16in., good condition. BCOEBUCK, Oldbury Road, Smethwick 0335

Several 7 kVA Sciaky Spot Welding machines.—BOX C629, MACHINERY, Clifton House, Euston Road, N.W.I.

Gisholt IL Combination Turret Lathe. A.G. Head. 3in. hole in spindle. Swing over saddle 16in. Max. turn off saddle 35in. 7.5 h.p. motor. Electrics 400/3/50. With equipment. Excellent condition.—BOX C552, MACHINERY, Clifton House, Euston Road, N.W.1.

USED AND RECONDITIONED MACHINE TOOLS FROM



CAPSTAN LATHES WARD 2A ball chuck. WARD 7 comb. turres lathe. HERBERT No. 9 comb. turret. HERBERT No. 3 Auto. P & J 5D auto capstan. DRUMMOND K type capstan. GISHOLT No. 3 capstan.

CENTRE LATHES
BROADBENT 14in. by 84in. gap bed.
ATW 12in. by 120in. A.G.H. st. bed.
SIMMONDS 12in. by 66in. gap bed.
COLCHESTER 84in. by 54in. gap bed.
SMART & BROWN 5in. by 24in.
presiden

MILLING MACHINES
CINCINNATI No. 2 dial type vert.
MILWAUKEE No. 2 universal.
PARKSON 3J Universal.
ARCHDALE 28in. horizontal.
HERBERT 15S vertical.

GRINDING MACHINES
LANDIS 12in. by 24in. universal.
B & S No. 13 universal.
PRECIMAX MPI 12in. by 40in. cyl.
WICKMAN optical profile grinder.
HUNT No. 2 and No. 3 drill grinders.
MATRIX No. 10 thread grinders.

Also Drills, Shapers, Gear Cutting Machines.

Hire Purchase Part Exchange

Send for Lists

The Causeway, Egham Surrey

Siemens Schuckert Electrically Heated Furnace, 6ft. 10in. dla., 8ft. 10in. deep, 550 deg. C., 100 kW, 400 voits. New Process 100 kVA Seam Welder, 400/S/50. British Federal 50 kVA Flash Butt Welding

British Federal 50 kVA Flash Butt Welding Machine. 400/3/50.
Fielding Hydraulic Pipe Bender, up to 8in. 200 Ton Fielding Downstroke Hydraulic Press, 14in. ram, 42in. stroke, 63in. daylight. 100 Ton Fielding ditto, 10in. ram, 72in. stroke, 90in. daylight. 50 Ton Fielding ditto, 10in. ram, 72in. stroke, 90in. daylight. 50 Ton Geared Double Sidd Power Press. 400/3/50 supply. 3Bilss No. 304 Vertical Single Action Drawing Presses, 74in. stroke, 50 tons. American. Bennie Punching, Shearing and Section Cropping Machine, 44in. 44in. 4 in. angle. Windsor 6-oz. Plastic Injection Moulding Machine.

Comming Machine, 4 jin. × 4 jin. × 1 jin. angle. To print Machine.

Machine.

Rushworth Guillotine, 6ft. × jin. Bedgewick Bending and Folding Machine.

Rushworth Guillotine, 6ft. × jin. Bedgewick Bending and Folding Machine.

6ft. × jin., motorised.

"Fyramid" Bending Rolls, 6ft. 0 jin. × jin. Scriven 4ft. 0 jin. × jin. Hand Bending Rolls. Besco 4ft. 0 jin. Hand Folding Machine.

200 Tons Tangye Hydraulic Straightening Press, bed 25ft. × 3ft., stroke 21in., motorised ravelling table. 2 ram pump.

Hust Straightening From 16 jin. to 8ft. wide, 13 jin. 1 jin.

auxiliary.

10 To. Heywood, 34ft. span. Unused. 10 Toa Morris, 32ft. 10in. span, cab control. 10 Ton, 60ft. span. 1955. (Two.) 7 Ton, 37ft. span. 1950. (Two.) 5 Ton, 37ft. span. 1950. 3 Ton Morris, 149ft. span. 1954.

FRED WATKINS (ENGINEERING), Late. Coleford, Glos. 'Phone: Coleford 2271 (5 lines)

H.M.E. Press, L20 Inclinable, adjustable, stroke, 20 ton cap. Mot. Guards, ex. cond.; Ratzer 12 ton, almost new cond.—C. L. THOMAS LTD., Stirling Road, Solihull. Tel.: 3075-6.

Edwards 6ft. × in. Bending
Rolls, 400/8/50.—BOX C785, MACHINERY,
Clifton House, Euston Road, N.W.I.

2 Wickman Horstman Thread Grinding Machine. Form relieving. Fully motorised.—BOX C738 Machinery, Clifton House, Euston Road, N.W.1.

RAPITAGIR All Annealing Oven. Temp. 400 deg. C. Gas-fired. Conveyor speed 25 i.p.m. Capacity 500 per hour. All tubes 1½in. dia, × 6in. long.—BOX C706, MACHINERY, Clifton House, Euston Road, N.W.1. Rapiradia Ali Annealing Oven.

Wadkin Bandsawing Machine, size 36. Table 38in. × 36in. with extension 23in. × 26in. Electrics 400/3/50. £356 0.n.o.—BOX C707, Machinery, Clifton House, Euston Road, N.W.1.

NEW MACHINES EX-STOCK

VICTORIA U2 mill.
VICTORIA TV2 mill.
BEAVER VBRP mill.
LEYTOOL 2in. slotter.
INVICTA 4H shaper.
PROGRESS drilling machines.
EXCEL No. I surface grinder.
MILFORD tool grinders. S & B H5 toggle presses. SUPERALPHA 6in. by 40in. lathe.



THE CAUSEWAY, EGHAM, SURREY

Tel: Egham 4166/7

LEONARD ROTH

ABBOT ST., KINGSLAND HIGH ST., DALSTON JUNCTION. LONDON, E.S.

Tel.: CLIssold 0513/4

TERMS ARRANGED

DEAN, SMITH & GRACE 6 in. Centre Lathe, 8 in. 3 Jaw Chuck, Motorised

Lathe, 8½in, 3-Jaw Chuck, Motorised 400/3/50, 2275.

**MERICAN TOOL WORKS Lathe, 9½in, 4ft, 6in, Between Centres, 400/3/50, £150.

**TAYLOR & CHALLEN 20 Ton Double Sided Geared Power Press, 5in, Stroke, 400/3/50 Motor. 295.

**RHODES No. 8 Power Press, 1in, Stroke, Fitted Guards, Motorised 400/3/50, £45.

**EDWARDS 40in, Geared Bending Rolls, Slip Type. £35.

**T.H. Engraving Machine, Model "MA" with Cutter Grinder, 400/3/50. £75.

PLEASE WRITE FOR LISTS

Brown & Sharpe Omniversal No. 0 Toolroom Milling Machine, in AS NEW condition. Today's new price around £6,000: will accept £2,000.—BOX C728, MACHINERY. Clifton House, Euston Road, N.W.1.

Sharples Super Centrifuge Oil Purifier. Type M/4/P/IE. Motorised.—WILCOX & CO., Barr Street, Birmingham 19. NORthern 1234/5.

LOEWE MODEL FU4F8 UNIVER-SAL MILLING MACHINE

Fully motorised, Mono lever control, power feed and rapid traverses in both directions to table only, hand cross feed and vertical traverse.

Working surface of table 40in. × 8in. 23in. Speeds 45-750 r.p.m.

Fully universal dividing head, tailstock arbor, arbor supports, braces, guards, suds pump, etc. New 1953.

PRICE: 2975

BOX C776, MACHINERY, Clifton House, Euston Road, London, N.W.1.

K·E·N·T

HILLING AND HOBBING

Maximiller Vert. Mill, 76in. × 18in., 888 T/S. Power to spindle and rapid all ways. REBUILT.
Somus F.V.2C, 60in. × 14in. Vert. Somus F.V.2C, 60in. A As new. As new. Herbert 18V Vert., 57in. × 14in. With £525 rotary table.

Becker Vertical, 54in. × 14in.

Sant Andrea U.F.O.3, 57in. × £525 £150 14in. As new.
Archdale 24in. Manufacturing.
Adams No. 5 Spline and Thread Hobber.
£425

PRESSES AND SHEET METAL MACHINERY

Edwards 6ft. × §in. Rolls. New. 2295 S. Platt 3in. × 14g. Tube Roller. 2395 C.V.A. 10 Ton Dieing Press. Roll feed and scrap cutter fitted. Kendall & Gent Duplex Screwing M/c. Tangential heads, 2§in. cap. £400

CAPSTAN LATHES

Ward 2A. Feed to saddle.
Gisholt No. 3 Capstan.
Brown & Sharpe No. 2. Iin. cap. £145
Herbert No. 9 Turret.
Smart & Brown in. cap. Capstan.

LATHES

Willson 84in. x 4ft. 6in. S.S. & S.C. £495
Niles 40in. swing x 5ft. Heavy Duty.

Dean, Smith & Grace S.S. & S.C., 36in.
swing, 12ft. 6in. between centres.
Ditto. Non-acrewoutting.
Churchill-Redman 6½in. x 3ft. 6in. £225
Lang 64in. x 3ft.
Dean, Smith & Grace 8½in. Surfacing and
Boring.

MISCELLANEOUS

Acme Gridley 6-sp. Auto, žin. cap. Maiden Bar-anding Machine. Granor 26in. Heavy Duty Shaper. £575 Coventry Climax 1,500lb. Fork Lift Cincinnati 12in. x 48in. Univ. Grinder

> Many other machines in stock. All motorised 440/3/50.

K.E.N.T MACHINERY & ENGINEERING CO. Datchelor Place Mews, London, S.E.S. Telephone: ROD, 4149

Cincinnati O-8 Vertical Milling Machines. Table working surface 20in. × 6in. Automatic cycle. Good condition. £250 each.—BOX C554, Machineby, Clifton House, Euston Road, N.W.1.

Kendall & Gent Profile Milling

Machine, with twin spindle. S/No. 10953A. Asquith Twin spindle Profile Milling Machine, spindle speeds 250 to 3,000 r.p.m.—BOX C555, Machinery, Clifton House, Euston Road, N.W.I.

Oniversal Testing
Capacity 10.000 lb. Tensile
compression and bending.—WILCOX & CO.,
Barr Street, Birmingham 19. NORthern
1234/5. Denison

Apr

Selections of Machine Tools from Stock or Early Delivery

BYOM SCOCK OF EATIY DESIVERY
DEBILLING MACHINES
LYCHEN & WADE 6ft. Girder Type Radial Drilling Machine, 18 spindle speeds, 6 feeds, No. 5 M.T. spindle, motorleed 400/3/50 supply.
ARCHDALE Column Type Vertical Drilling Machine, compound table 27in. × 16in., No. 4 M.T. spindle. Motorleed 400/3/50 supply.
COBONA 48in. High Speed Radial Drilling Machine, 8 speeds 84-1.465 r.p.m., No. 3 M.T. spindle. Motorleed 400/3/50 supply.
Spindle. Motorleed 400/3/50 supply.
Spindle. Motorleed 400/3/50 supply.
Brilling and Tapping Machine. Motorleed 400/3/50 cycles, with loose box drilling table

BORING MACHINES
RAHAM & NORMANTON Surfacing and
Boring Lathe, swing 42in, dia, in gap, 18
spindle speeds 2/461 r.p.m.,motorised 400/3/50

supply.

WEBSTER & BENNETT Series D 36in. Single Column Type Vertical Boring Mill, motorised 400/3/50 supply.

SLOTTING MACHINES
ORMEROD 12in. stroke Slotting Machine, 27in
dia. rotary table, motorised 400/3/50 supply

LANG 15in. Centre Lathe, two saddles, admit 17ft, 6in. between centres, motorised 400/3/50 attribute.

11. Sim. S.S. & S.C. Lathe, admits 4t. 3in. between centres, 32in. dia, swing in gap, 8 spindle speeds 30/400 r.p.m., motorised 400/3/50 cycles.

MILLING MACHINES
CINCINNATI Model 4/48 Plain Hydraulic Milling
Machine, size of table 65in. × 16in., longitudinal table feed 48in., motorised 400/3/50

tudinal table feed 48in., motorised 400/3/50 cycles supply.

HERRERT No. 46V Vertical Milling Machine, with sliding head, working surface of table 58in. × 15in., longitudinal traverse of table 36in. 12 spindle speeds 25/500 r.p.m., motorical 400/3/50 supply.

C. A. Karacy of Tecker model 2E Dial X-De Karacy of Tecker model 2E Dial X-De Karacy of 18in Milling Machine, working surface of table 41in. × 12in., longitudinal feed 29in., cross feed 12in. 8 spindle speeds 25/1,000 r.p.m., motorised 400/3/50 supply.

supply.

CINCINNATI Model 3/36 Hydromatic Milling Machine, table 54in. × 14in., motorised

CINCINNATI MOURI 9:00 X 14in., motorised Machine, table 54in. X 14in., motorised 400/3/50 cycles.

MANN Vertical Milling Machine, with swivel head, dial change to spindle speeds and feeds, table 46in. X 12in., 9 speeds 48/750 r.p.m., motorised 400/3/50 supply.

RENDALL 46 GENT CVM25 Vertical Miller, 55in., 14 and 15in., 15

ised 400/3/56 supply.

RROACHING MACHINE
CINCINNATI 10 ton Vert. Single Ram Hydraulic
Surface Broaching Machine, 66in. stroke,
20in. x 20in. table, motorised 400/3/56 cycles.

GRINDING MACHINES
PRECIMAX Model MPL 6in. x 24in. Hydraulic
Plain Cylindrical Grinding Machine, hydraulic
feed to table, motorised 400/3/56 supply.

JONES & SHIPMAN Fig. 540 Horisontal
Spindle Hydraulic Surface Grinder, table
18in. x 6in., motorised 400/3/50 cycles.

POWER PRESS

POWER PRESS

New BUTTERLEY 5D Power Press, 40 tons capacity, adjustable stroke 4 in.

NOBLE & LUND 24in./28in. Cold Circular Sawing Machine, 10in. dis. rounds, 9in. squares, 18in. ×7in. beams, motorised 400/3/50 cycles.

eycies.

SCREWING MACHINES

KENDALL & GENT 3-2 Tangential Head
Screwing Machine, to screw bolts up to 2in.
outside diameter, tubes up to 3in. inside
diameter, machine fitted with leadscrew,
motorised 400/3/56 supply.

MISCRILANEOUS
CLYDE 10 ton Overhead Electric Travelling
Crane, 42ft. 3in. span. All the above machines are motorised 400-440/3/50 cycles.

JOHN CASHMORE LTD. GREAT BRIDGE, STAFFS, Tel.: Tipton 2181/7.
(Also at NEWPORT, MON.)

Classified Advertisements (PLANT FOR SALE, contd.)

EDWIN MILLEN & SONS LTD. 70, CLERKENWELL ROAD,

LONDON, E.C.1. Tel.: CLE. 6064 & 3602.

DRILLING AND TAPPING HERBERT 1-sp. Drill on three-spindle base.

£165. HAGO H.G.25 High Efficiency, \$in. cap. £250. GRINDERS REID No. 2 18 × 6 Surface. BROWN & SHARPE No. 2 18 × 6 Surface. JONES & SHIPMAN 540 Surface. SCRIVERER No. 1 Controless, with auto. feed. SMARF & BROWN Internal Grinder. 18in.

NORTON 18in. × 7in. Hyd. Cyl. Grinder. £395.

MURAD 4in. × 24in. AGH Lathe. £125. KERRY 54in. × 24in. 8.8. & S.C. Lathe. WARD No. 7 Capetan B/F, B/C. CV-A. No. 8 Automatic. COLCHESTER STUDENT 6in. × 24in.

equip.

HARRISON 44in. × 42in. G.B. Full equip.

HOGARTH 6in. × 32in. 8. & S. Lathe. £125.

PITTLER Turret Lathe. 24in. cap. £95

RIVET Instrument Lathe. 44in. × 24in.

SPRINGIFIELD 34in. Swing F. & B. Lathe. £450.

SPRINGIFIELD 14in. Swing F. & B. Lathe. £225.

ADCOCK & SHIPLEY 1VM Vert. 25in. × 7in.

AS NEW. 24in. × 6in. Prec. Auto feed. 25in. × 7
HARDINGE 24in. × 6in. Prec. Auto feed. The POWER PRESSES AND SHEET METAL
MACHINES
BESCO 10 ton Power Press. £175.
HUMPIREYS 10 ton Power Press. £175.
COMEN 10 ton Friction Screw Press.
E.M.G. 9-ton Airdraulic. £200.
KENNEDY 2in. Tube Bender. £85.
FLY and Kick Presses.

MISCELLANEOUS
THIEL Punch Shaper.
ORMEROD 12in. Shaper with Cam Cutting

Attach.
TMA Engraver with type.
AEROGRAPH Twin Cylinder comp. 100 p.s.i.
MATHEY Jig Borer with clocks. As new.
RAPHOR 15in. x 15in. Filing and Sawing. £165.
PFAUTER 000 Gear Hobber, with gears. £150.
PHILLIPS 40 kVA Spot Welder. £165.
CHARLES TAYLOR 6 in. Spinning Lathe. £85.

Other machines in stock.

WE BUY **EXCHANGES** WELCOME

WE SELL HIRE PURCHASE ARRANGED

Kearns Horizontal Boring Ma-A carms riorizontal Boring Ma-chine, Model "O." Table dimensions 36in. × 36in., longitudinal traverse doin., transverse motion 15in. Spindle bore No. 5 morse taper. Speeds 72 to 620 r.p.m. Three speed motor. Cheap to clear.—BOX C557, Magningery, Clifton House, Euston Road, N.W.I.

Autolec Electrode Boiler, Type 226. 35 kw., 415 volts. Max. pressure 160 lb. per sq. in. Excellent condition. Purchased 1956.—BOX. C634, MACHINERY, Clifton House, Euston Road, N.W.1.

Edgwick Vertical Keyseating Machine. 4jin. stroke, throat 8jin., max. daylight 15in. to 3in. Table 32in. × 9in. 5jin. cross slide traverse; 16in. table traverse 6s spindle speeds, collet holders and colletes, 1i h.p. motor, 400-440/3/50. 690-1,440 r.p.m. Switchgear complete.—BOX C561, MACHINERY, Clifton House, Euston Road, N.W.1.

American First Class Machines of all types can be supplied from our American Showrooms. Send your enquiries to K & C MACHINERY, LTD., Stephen Street, Coventry. Telephone: Coventry 23669.

Archdale Heavy Duty Borer, single spindle. 50 Int. taper. Modera machine. Power to rise and fall. Table 19in. × 56in.—BOX C701, Machinery, Clifton House, Euston Road, S.W.I.

MARTIN

EMPRESS WORKS, EMPRESS STREET CORNBROOK, MANCHESTER, 16

> Members of B.A.M.T.M. Tel.: Trafford Park 1091-2

USED MACHINES IN STOCK AVAILABLE FOR IMMEDIATE DELIVERY

RICHARDS HB2 Horizontal Borer. ASQUITH 5ft. Radial Drill. POLLARD 3 spindle No. 3 M.T. Drill. WARD 7 Capstan Lathe.
HERBERT No. 4 Capstan Lathe.
CHURCHILL No. 0 6in. × 18in. Univer-

sal Grinder.
HUNT No. 3 Twist Drill Grinder.
CHURCHILL REDMAN 13 NM ×
7ft. 6in. S.S. Lathe.
WARD HAGGIS SMITH 24in. Surfacing

and Boring Lathe.

ARCHDALE 28in, Manufacturing Miller.

RACCINE 6in, Hacksaw.

NEW MACHINE TOOLS IN STOCK OR ON SHORT DELIVERY

IMMEDIATELY AVAILABLE NEW H.M.V. 75 HORIZONTAL BORING MACHINE. 3in. tra-velling spindle, 18in. facing head, revolving table 40in. × 32in., rapid traverse all ways, fitted with rules and dial gauges.

FOBCO in. Bench Drill.
GRIMSTON 6in. and 8in. Double Ended

Grinder.
UNION Tool and Cutter Grinder.
HARRISON 8in. × 36in. S.S. & S.C. Lathe

WORCESTER 6 Ton Crank Press. PILOT 12 ton Hydraulic Press.

MACHINE TOOLS AVAILABLE FOR SALE BUT NOT IN STOCK

PEGARD Kneeless Type Vertical Miller 36in. under spindle, table travel approx

Shear and Angle Cropper.

ASQUITH 6ft. Radial Drill with screw

cutting attachment.

ORCUTT 24in. Automatic Gear Grinder

MACHINES MOTORISED 400/3/50 UNLESS OTHERWISE STATED

The above list is only a selection of the sany New, Used and Rebuilt tools available lease call or write for our priced brochure We will rebuild your own machine tools back to makers' specification with 6 months' guarantee.

Snow Vertical Spindle Surface Grinding Machine, type VB18, size 72in.× 15in., hydraulic feed to table. Excellent condition.—BOX C736, MACHINERY, Clifton House, Euston Road, N.W.1.

Orcut Spline Grinder with Automatic wheel truing, automatic dividing head and all hydraulic canacity between centres 30in.—Offers to: BONEHAM & TURNER LTD., Mansfield, Notta.

B.S.A. Jin. Self-cont. Mot. Automatic, slotting att., gears, barfeed stands, etc. Ex. coad.—C. L. THOMAS LTD. Stirling Road, Solibuil. Tel.: 3075-6.

R.O. GRAY

CLEVELAND Model "A" Single Spindle Automatic. Capacity 4½in. dia. bar. 415/3/50.

MAGERLE F.10 Horizontal Surface Grinder, hydraulic. Table W.S. 41\(\frac{2}{3}\) in. by 9\(\frac{2}{3}\) in., with Barnesdrill Magnetic Coolant Separator.

DISKUS Vertical Spindle Surface Grinder. Table 53in. by 10in. Hydraulic feeds, 12in. dia. segmental wheel.

CINCINNATI 6in. by 26in. Plain Grinder, Filmatic bearings, variable hydraulic table traverse, plunge cut grinding.

CHURCHILL Model "O" Universal Tool and Cutter Grinder, 8in. by 16in.

JONES & SHIPMAN 310 Tool and Cutter Grinder, 8in. by 16in.

MATRIX No. 10 Thread Grinder, with crushing attachment.

BROWN & SHARPE No. 2 Universal Milling Machine. Table W.S. 46in. by 10in. Spindle speeds 30-1,300 r.p.m. Vertical attachment, slotting attachment, universal dividing head, rotary table, etc.

CINCINNATI 0-8 Vertical Milling Machine. Table W.S. 20in. by 6in. Spindle speeds 150 to 1,300 r.p.m.

THREE HERBERT O.V. Vertical Milling Machines, swivel head. Table W.S. 18in. by 5in. Spindle speeds 250-2,000 r.p.m.

ARCHDALE 28in. Plain Horizontal Milling Machine. Table W.S. 49in. by 13in. Power feeds and rapid traverse.

18in. EDGWICK Plain Horizontal Milling Machine. Table W.S. 26in. by 7in.

PALLAS H.O. Plain Horizontal Milling Machine. Hand lever feed. Table W.S. 16in. by 5in.

TRIDENT V.O. Swivel Head Vertical Milling Machine, table W.S. 30in. by 8in.

DRUMMOND Model K Capstan Lathe, arranged for chucking. 2 in. Hollow Spindle.

GISHOLT No. 4 Capstan Lathe, arranged for chucking, 2½in. Hollow spindle.

TURNER 11 in. Capstan Lathe, with bar feed.

TWO HERBERT No. 2B Capstan Lathes, one with bar feed, one arranged for chucking.

HERBERT No. 1S Capstan Lathe, chucking. KITCHEN & WADE Heavy Duty Vertical Drill. Spindle bored No. 4 M.T. 24in. dia, rise and fall table, swings round column.

TWO HILLE two-spindle drilling machines. Power feed and independent motor to each spindle, fitted \(\frac{1}{2}\)in. drill chuck. W.S. Table 21\(\frac{1}{2}\)in. by 9in.

ARCHDALE 6ft. Radial Drill, No. 5 M.T. Tee slotted low base 4ft. by 6ft.

THIEL No. 6 Radial Arm Tapping Machine, ‡in. Whit.

SUPERIOR Vertical Tapping Machine, \(\frac{1}{2}\)in. Whit.

HERBERT No. 2 Flash Tapper.

ALBA 18in. Crank Shaping Machine.

SIX TURNER Spin Riveting Machines. Type RS5.

EDWARDS 4ft. by 14G Power Guillotine. KENDRICK 4lin. by 16g Hand Operated Box Folding Machine.

TAYLOR & CHALLEN 10-Ton Inclinable Power Blanking Press, ½in. stroke.

AVERY Dynamic Balancing Machine, 220-lbs.

DEAN, SMITH & GRACE 24in. Swing
Boring and Surfacing Lathe, 3in. Hollow
Spindle. Hexagon turret on compound
slide rest.

CHURCHILL-CUB 5in. Lathe. Admits 24in. between centres.

GLASS 9½in. by 10ft. 6in. S.S. & S.C. Gap Bed Lathe. 2½in. Hollow Spindle, swing in gap 30in. dia. Admits 6ft. 6in. between centres.

TWO COULTER Vertical Spindle Fine Boring Machines.

PEARN-RICHARDS No. 2 Horizontal Boring and Facing Machine. Dia. of facing head 20in. With vernier height gauge and boring bars.

KEARNS No. O.A. Production type Horizontal borer with 2½in. dia. traversing spindle.

BULLARD Maximill Vertical Boring and Turning Mill, capacity 50in. dia. Height under cross rail 34in. Two independent swivel toolposts.

TWO T.M.A. Engraving Machines. With Copy Holder.

All machines self-contained drive. 400/440 volts, 3 phase, 50 cycles.



4/6, MINERVA ROAD, PARK ROYAL, LONDON, N.W.10.

Telephone: ELGar 4841/4842

Apr

10

Cut whe hyd LE: Tel.

D

fitte

N

B

PEARN-RICHARDS PRT2N Horizontal Bor-ing and Facing Machine, 3in. traversing spindle, chain drive to head, coolant fittings, 400/3/50.

SONDERMANN & STIER 8ft. Double Column Heavy Duty Vertical Boring and Turning Mill, with side head, swing 104in. dia., admit 58in. high table to cross-elide,

PENSOTTI K.T.V.1050 Turret Type Vertical Boring and Turning Mill, with side head, swing 43in. dia., table speeds 10 to 125 r.p.m.

WEBSTER & BENNETT 48in. Single Column Turret Type Vertical Boring and Turning Mill, to swing 104in. dia. Taper turning attachment, 35 h.p. motor.

ASQUITH O.D.1 4ft. 6in. Radial Drilling and Tapping Machine. 5 M.T. spindle. Tapping × 36 and Tapping Base 53in. X BROWN & SHARPE No. 13 Gear Cutting

NORTON Model C 14in. × 36in. Hydraulic Universal Cylindrical Grinding Machine. Excellent equipment including internal

SNOW Vertical Spindle Hydraulic Surface Grinding Machine. Table 30in. × 8in.

BROWN & SHARPE No. 2 Surface Grinding Machine, Table 18in. × 6in.

NOW Model T20 Table Type Surface Grinding Machine, with extended table, dust extractor, etc. Three machines available, in SNOW Model T20 excellent condition.

WARD No. 13 Combination Turret Lathe, covered bed, 25in. concentric chuck, 27in. 4-jaw independent chuck, good turret tooling, taper turning attachment, 35 h.p. motor 400/3150. Modern machine. Excellent condition

HERBERT No. 7A Combination Turret Lathe, covered prismatic bed, 15½in. swing, speeds 30 to 750 r.p.m., 400/3/50.

HERBERT No. 4 Capstan Lathe, bar feed, flamard bed, speeds up to 750 r.p.m., arranged for screwcutting.

WARD No. 7 Chucking Capstan Lathe. With covered bed, excellent equipment.

WARD No. 3A Chucking Capstan Lathe, 13in. swing, 13in. hollow spindle, speeds 42 to 825 r.p.m., 400/3/50.

SWIFT 12-in. Centres Gap Bed S.S. & S.C. Lathe, 6ft. between centres, 400/3/50.

NEW TEST No. 2 Universal Milling Machine. Table 48in. × II in. Complete with dividing head, vertical milling attachment, etc.

CINCINNATI No. 4 HP. Heavy Duty Vertical Milling Machine. Table 72in. × 19in.

GRAFFENSTADEN FHIOIR High Speed Plain Horizontal Milling Machine. Table 51in. × 114in. Speed 32 to 1,600 r.p.m.

MILWAUKEE Plain Horizontal Milling Machine. Table 63in. x 13in.

SOMUA FV48 Vertical Milling Machine, table

CINCINNATI Model EA.I-I8 Plain Horizontal Milling Machine. Table 35\(\frac{1}{2}\)in. \times 10\(\text{in.}\)

35 GREENWICH CHURCH ST. LONDON. S.E.10 GRE.1222

CAPSTAN LATHES

WARD 3A I in. capacity, chucking, power feeds to turret.
WARD 3A I in. capacity, chucking, power feeds to saddle and turret.

TURRET LATHES

URRET LATHES
WARD No. 16 covered bed, 8-jin.
spindle, 32in. 4-jaw chuck, rapid
and power feeds to saddle, cross
slide and turres, power rotating
turret, spindle speeds 7-225 r.p.m.,
50-h.p. motor.
WARD No. 10/13 covered bed,
4-jin. spindle, ss.&sc., etc.
WARD No. 10 covered bed, 4-jin.
spindle, ss.&sc., etc.

spindle, ss.&sc., etc. WARD No. 10B covered bed, 4\fin. spindle, power rotating turret, power and rapid feeds to turret only, collet head and bar feed.

DRILLING MACHINES

CORONA 3 spindle, 84-1,450 r.p.m. No. 3 Morse, pole change. AVEY 2-spindle drill, pedestal base, ‡in. capacity.

HORIZONTAL MILLERS SUNDSTRAND No. 2 Electro Mill. Auto cycle I2in.×54in. table EDGWICK No. 2, IIin.× 42in. table, No. 40 steep taper. JONES & SHIPMAN duplex slot

VERTICAL MILLERS

WADKIN high speed for light alloy, 16in. x 40in, table.

GRINDING MACHINES

RINDING MACTINES
PRECIMAX M.P.H. 10in. x 36in.
plain hydraulic cylindrical grinder.
LANDIS 10in. x 24in.
hydraulic cylindrical grinder.
B.S.A.-LANDIS 6in. x 18in.
hydraulic cylindrical grinder.
CHURCHILL HBB hydraulic internal grinder, autosizing. CHURCHILL 35in. stroke hydraulic openside slideway grinder.
ABWOOD carbide tool grinder.
ROWLAND 18in. double-ended disc grinder.

All machines motorised 400/3/50 unless otherwise stated.

American Toolworks Centre Lathe, 19in. Swing, 30in. between Centres. Spindle speeds 17-600 r.p.m. Excellent condi-tion.

on.
Further details from:
C. & G. OLDFIELD, Lad.,
15, Abercorn Street,
PAISLEY.

HERBERT

& SONS LTD.

CANAL STREET, NOTTINGHAM

'Phone: 51891

Norton 60in. × 12in. Horizontal Spindle Surface Grinder, electric chuck, 400/3/50.—A. McNAMARA & CO., LTD., New Line, Bacup, Lancs. 'Phone: 'Bacup 946.

Collets for Gridley 1sin. Auto-matic. All sizes. Cheap.—MARTIN matic. All sizes.
POOLE. CALthorpe 3545.

7. J. Edwards Ltd

CAPSTAN AND TURRET LATHES

HERBERT No. 21 Combination Turret 'Lathe, swing 28in, over the bed, 7½in, hollow spindle, chasing saddle with automatic sliding and surfacing feeds.

HERBERT No. 7 Combination Turret Lathes, hollow spindle 2 1 in. dia., 16 in. swing, speed, 18-366 r.p.m.

LIBBY 4A Capstan Lathe, 24in. hollow spindle, 204in. swing, speeds 27-725.

wARD No. 7 Combination Turret Lathe, 144in. swing, 24in. hollow spindle, speeds 13-520 r.p.m., chasing saddle, ball chuck. HERBERT Model 28 Capstan Lathe, collect capacity 14in. dia., 11in. swing, ball chuck and bar feed, speeds 28-2,100.

DRILLING MACHINES

G.S.P. 9ft. Radial Drilling Machine, spindle traversing, No. 6 morse taper, speeds 8-1,725 r.p.m. As new.

HERBERT 7ft. Radial Drilling, Tapping and Boring Machine, spindle No. 5 M.T., 20in. dis. column. Weight approx. 8 tons.

TOWN 5ft. Radial Drilling Machine, spindle No. 5 M.T., speeds 26-580 r.p.m.

TOWN 4ft. 6in. Radial Drilling and Tapping Machine, Model AE4, No. 5 M.T. (New.) CINCINNATI BICKFORD 36in. Radial Drilling Machine, spindle No. 4 M.T.

SEGIO (Swedish) 27in. Radial Drilling Machine, 14in. capacity, speeds 80-890 r.p.m. (New.) LELAND GHFFORD 3-apindle Drilling Machine mounted on 4-spindle base, spindles No. 3 M.T. one spindle with power feed, pole change motors. 8 spindle speeds 165-1,590 r.p.m.

ARCHDALE No. 2240 28in. Production Type Drilling Machines, capacity in mild steel 3in. dia.

HERBERT Type C Pedestal Drilling Machine, No. 3 M.T., 230 volts, single phase. Auto spindle feed, flange mounted motor.

ENGRAVING MACHINES

TAYLOR, TAYLOR & HOBSON Model D Engraving Machines. (New.) TAYLOR, TAYLOR & HOBSON Model A Bench Engraving Machine. (New.)

T.M.A. Model G2 Engraving Machine, panto-graph reduction 1: 1-7: 1.

GEAR CUTTING MACHINES

CHURCHILL-CLEVELAND Model 120 Rigid-hobber. Capacity 6in. dia. × 9in. face, 3 d.p. BARBER COLMAN 12in. Gear Hobber.

FELLOWS No. 645A3 Gear Shaper, capacity 18in. × 3in. for spurs and helical gears.

GENERAL LATHES

BETTS-BRIDGEFORD 30in. swing × 22ft. Lathes, 16ft. between centres.

OLDFIELD & SCHOFIELD 21in. centre × 15ft. Gap Bed Lathe, 6ft. between centres 4in. hollow spindle, 62in. swing in gap.

COLCHESTER TRIUMPH 7in. \times 6ft. 6in. Gap Bed Lathe, 4ft. between centres. WILLSON 7 in. × 6ft. Gap Bed Lathe, 3ft. between centres.

BERRY 81in. × 8ft. Lathe, 4ft. between centres. SOUTHBEND 71in. × 5ft. Lathe, 2ft. between

DEAN, SMITH & GRACE 6jin. centre 13Z

LANG Junior 64in. × 6ft. Lathe, 30in. between LANG 24in. Surfacing and Boring Lathe.

LE BLOND 10in. Rapid Production Lathe, 7ft. between centres, 1 in. hollow spindle, speed 45-300 r.p.m.

CROMWELL 3½in. × 40in. Lathe, stepless speeds to 2,000 r.p.m.

359-361, EUSTON RD., LONDON, N.W.1 Telephone: EUSTON 5000. Telex: 24264. And at Lansdowne House, 41, Water St., Birmingham, 3. Telephone: Central 7606-8

LITTON'S MACHINE TOOL CO., LTD.

MATTISON 36in. × 12in. Horizontal Spindle Surface Grinder. Hydraulic feeds up to 100ft. per minute. Fitted 36in. x 12in. magnetic chuck, wheel size 20in. Motorised 15 h.p. 400/440 v., 3-phase, 50 cycles.

CINCINNATI No. 4 Dial Type Vertical Milling Machine. Table size 78in. × 16in. Rapid traverse. Spindle speeds 18–450 Rapid

PRATT & WHITNEY 30in. Vertical Milling Machine and Profiling Machine. Fitted vertical and horizontal spindles. Table size 30in. by 24in.

JONES & SHIPMAN 2 spindle adjustable centres Drilling Machine. Minimum centres 9in., maximum 50in. 2 Morse Taper. Spindle speeds up to 1,468 r.p.m.

GLEASON 3in. Bevel Gear Generators, longest cone 2½in. longest face ‡in. Largest pitch cut 10.

GLEASON No. 7 'Revex' Bevel Gear Roughers. 14in. diameter × 4 d.p. on 2in. face or 3-4 d.p., dependent on face

BARBER COLMAN Type 'A' Heavy Duty Gear Hobber, 12in. diameter gears × 12in. face × 4 d.p.

ACME GRIDLEY Model RPA-6 12in. swing chucking auto. Maximum length of turning 8in., range of spindle speeds 23 to 202 r.p.m. Travel of toolslide 8in., cross slide 2in. to

MUIR 12in. Slotting Machine, 32in. diameter, self-acting table. Motorised.

SWIFT 9in. × 9ft. S.S. Lathe. 12 spindle speeds 14 to 500 r.p.m. Swing over saddle 10in.

WARNER & SWASEY 3A Turret Lathe. Hole in spindle 4\frac{1}{2}in., maximum swing 24in.

Maximum length turned 44\frac{1}{2}in., spindle speeds 12 to 228 r.p.m.

Spindle Hydraulic Surface Grinders. 20in. × 6in. × 104in. high capacity. Table 424in. × 11in., table feed 0-25 per minute. Fine feed grad. 0-00025in. NEW EXSTOCK.

FULLY RECONDITIONED WARD 7 covered bed Capstan Lathe. Dead length chuck and bar feed. Motorised 400/440 v., 3-phase, co cycles.

DELIVERY 19-14 DAYS.

BARBER COLMAN No. 3 Gear Hobbing Machine, capacity 5in. ×7in. face × 12 d.p. PRAEHOMA 24in. × 8in. Hydraulic Surface

KITCHEN & WADE Vertical Cylinder Borer, capacity 2in., × 6in. diameter × 14in. deep. Three micrometer boring heads.

Horizontal CHURCHILL 'CRM' Crankshaft ReIraulic feeds grinders. Capacity 20in. × 36in. and 20in.
36in. x 12in.

Motorised cycles.

WADKIN Type LZV Spar Miller. Mills spars up to 30ft. long, infinitely variable cutter speeds up to 1,000 r.p.m., power feed cycles.

WADKIN Type LZV Spar Miller. Mills spars up to 30ft. long, infinitely variable cutter speeds up to 1,000 r.p.m., power feed traverse from 2in. to 300 r.p.m. Swing over

ASQUITH & HERBERT HUNT Twist Drill Grinders, ‡in. to 3in. capacity.

BLANCHARD 26in. Rotary Surface Grinder. SWIFT 12in. × 12ft. S.S. Lathe, 7ft. between

POLLARD 28AE Vertical Pedestal Drilling

Machine, table 28in. x 22in., throat 12in., maximum daylight 3ft., spindle 3 Morse Taper, 5 speeds 52 to 605 r.p.m. Spindle travel 12in., motorised 6 h.p. 400/440 v., 3-phase, 50 cycles.

BARNES Model 2024 Vertical Hydraulic Honer, capacity 16in. bore × 50in. stroke.

ROWLAND ADD Hydraulic Duplex Grinding Machines, capacity 30in.

GENDRON type 350-2000 14in. × 80in. between centres Universal Grinder.

G.S.P. Sft. Radial Drilling Machine. spindle speeds. Low base.

KITCHEN & WADE 4ft. Radial Drill.

ASQUITH Model LDR 3ft. 6in. Radial Drill.

BROWN & SHARPE OOG High Speed Automatics. Jin. Bar Capacity. Motorised

FOR IMMEDIATE DELIVERY TOOLS MACHINE

Telephone: SHOreditch 4814/5

372-8 OLD STREET, LONDON, E.C.1

Telegrams: "Galloon, Ave. London."

Cutter Grinding Machine with rise and full wheelhead. Fully m/d along 8 minutes and full minutes and full

Lang 8½in. S.S. & S.C. Centre
Lathe, taking 5ft. oin, between centres.
Complete with 2 speed motor giving 16 Spindle
Speeds. Taper Turning Attachment. Excellent Speeds.

Further details from:—
C. & G. OLDFIELD, Ltd.,
15, Abercorn Street,
PAISLEY.

Drummond Maxicut No. 2 Multitool Lathe, 30in. between centres. Swing 22in., longitudinal saddle movement, 18in., fitted with extra sildes on front and rear toolposts. Auto. return to sildes. Motorised 45 h.p. 400-440/3/50—BOX C664, MACRINERY, Clifton House, Euston Road, N.W.1.

Universal Grinding Machine, 1942. Size 12in. × 36in. Condition good. External/internal equipment.—BOX C679, Machinery, Clifton House, Euston Road, N.W.1.

Bertram 121in. × 10ft. S.S. & S.C. Centre Lathe, complete with top Taper Turning Attachment, full length of bed. Further details from:—

C. & G. OLDFIELD, LTD. 15, Abercorn Street, PAISLEY.

Greenwood & Batley No. 0
Solid die, single blow, Cold Heading
Machine. Capacity in. × 1in. long.—HICKS
MACHINERY, Law. 26, Addison Placee
London, W.11. Tel.: PARk 2388.

× 24in. Churchill Model Archdale Snout Borer, Modern machine. Spindle dia. 5in. Table area 65in. × 19in. 7.5 h.p. Spindle nose 50 Int. taper.—
BOX C 770, Machinery, Clifton House, Euston Road, N.W.1.

HIGH QUALITY USED **MACHINE TOOLS**

HERBERT No. 12 Heavy Duty Combination Turret Lathe. Full chucking equipment. 400/8/50.

TOWN 28th. Vertical Spindle Drilling State of the Component and Application. We also pound table. 400/8/50.

Late W. State of the Component of the Component

400/8/50.

ARCHDALE 28in. Horisontal Manufac-turing Milling Machine, with power and rapid feeds. Table size 49in. × 30in. 400/3/50.

WE UNDERTAKE REBUILDING OF ALL TYPES OF MACHINE TOOLS

CENTAUR TOOL WORKS, EYRE STREET, SPRING HILL, BIRMINGHAM, IL

Boneham & Turner Fine Borer House, Euston Road, N.W.1.

USED MACHINES EX STOCK

HERBERT No. 7 Junior Combination Turret Lathe, chucking machine with extensive range of equipment, speed range 30 to 750 r.p.m. Excellent condi-

VICTORIA P2 Horizontal Mill, table 45in. × 11in. 1959 machine in first class condition.

SOMUA Horizontal Milling Machine, table 07in. × 14in., spindle speeds 32 to 1,250 r.p.m. No. 50 I.T. 18 feeds in to 10in per min., power feeds and rapid traverse in all directions. 1952 machine.

LE BLOND Lathe, 18in. swing × 9ft. between. A.G.H. 8.S. & S.C. Speeds 15 to 522, double vee straight bed.

CINCINNATI Plain Hydromatic Mill 3/86, speeds 27 to 200 r.p.m., power rapid traverse with auto cycle.

ASQUITH OD1 4ft. 6in. Radial Drill, 1 2 speeds 58 to 1,550 r.p.m. No. 5 M.T. 2 motors, power rise and fall, power feed spindle, loose box table.

All machines motorised 415/8/50

A. LAWRENGE & CO., (MACHINE TOOLS) LTD...

WELSH HARP, EDGWARE BOAD, LONDON, N.W.2.

Tel.: Gla. 0088,

Ap

Hain NI Du 400 KE

spir Cu

tail sur wh

RI



AUTOMATICE

BULLARD Multi-Au-Matic 7in. 8 spindle.
BULLARD Multi-Au-Matic 12in. 6 spindle

BORDIG MACHINES

KEARNS No. 4 Horisontal Boring and Facing
Machine, 4in. diameter travelling spindle, with
extended traverse.
KEARNS No. 2 Horisontal Boring and Facing
Machine, 3in. da. travelling spindle (1953).
KEARNS No. 4 Horisontal Boring and Facing
Machine, 4in. diameter travelling spindle.
WESSTER & BENNETT Vertical Boring
Machine, 4in. diameter travelling spindle.
RIGHARDS Type PET Horisontal Floor Boring
Machine, 3 im. travelling spindle, 28in.
diameter facing head.
GIDDINGS & LEWIS No. 45 Horisontal Boring
Machine, 5in. diameter travelling spindle.

CAPSTAN AND CENTRE LATHES

OLDYBLIA & SOHOPPELD Surfacing and Boring Lathe, 104 in. centre height. WARD 7B Combination Turret Lathe. HERBERT No. 12 Combination Turret Lathe 64 in. diameter hollow spindle. NILES Heavy Duty Centre Lathe, S.S. & S.C. 17 in. centre height × 28 ft. between centres. U.L.R.O. Heavy Duty Centre Lathe, 16 in. centre height × 30 ft. between centres.

DRILLING MACHINES

elevating arm.

TOWN 30in. Single Spindle Boring and Drilling Machine. Radial Drilling Machine, 10ft.

GEAR MACHINES

ORCUTT Model HM24 Hydraulic Interna-Gear Grinder. GLEASON Sin. Straight Bevel Gear Generator.

GRINDING MACHINES

LANDIS Plain Hydraulic Cylindrical Grinding
Machine, 18in. swing × 72in. between centres.
OFBOUTT Model HM2 Internal Spur Gear
Grinding Machines.
CRUSGHILL Plain
Grinding Machines.
CRUSGHILL Plain
Grinding Machine.
Solin. swing × 72in.
between centres.
BROWN & SHAPP Plain Cylindrical Grinding
Machine, 10in. swing × 85in. between centres.

MILLING MACRINES

CINCINNATI Model 5/72 Plain Hydromatic Milling Machine, table 91in. × 22in. (1952). CINCINNATI No. 2L Plain Horizontal Milling Machine, table 52in. × 10in. CINCINNATI No. 1M Vertical Milling Machine, CINCINNATI No. 4 Dial Type Horizontal Milling

Hachine
Hachine
Hachine
Hachine
Hachine, table 55th. × 10in.
Plant & WHITNEY Model BL3620 3-spindle
"Keller" Die Sinking Hachine,
CENTEO Motel 3R Automatic Production
Milling Machine, 4able 25in. × 16in.

PLANING MACHINES

BUTLER Double Column Planing Machine, capacity 12ft. × 5ft. × 4ft. 6in., 4 toolboxes.

RUSSEL Model 26/28 Hydrofeed Cold Sawing Machine. LANGE & GAILEN 28in. stroke Double Headed Hydraulic Shaping Machine. TAYLOE & CHALLEN Double Sided 50-ton Geared Power Press, 10in. stroke

NEWMAN INDUSTRIES LIMITED,

Machine Tool Division: YATE, BRISTOL Tel.: Chipping Sodbury 3311. Telex. 44121.
Cables: "Dynamo Yate."

London Office: Terminal House, Grosvenor Gardens, S.W.1. Tel.: Sloane 8206. Telex 23289.



HAVE AVAILABLE FOR EARLY DELIVERY

One NEWALL 2436 Jig Borer, fully rebuilt and carrying maker's

One NEWALL No. 0 Jig Borer, fully rebuilt and carrying maker's guarantees.

Capacity: 18in. by 12in. Table 14in. Spindle Nose to top of table

ne NEWALL 'L1' Internal Grinding Machine, 10in. by 24in. fully rebuilt and carrying maker's guarantees. Maximum maker's guarantees. Grinding Depth: 12in.

One NEWALL No. 1 Jig Borer, fully rebuilt and carrying maker's guarantees.

One NEWALL No. 2 Jig Borer, fully rebuilt and carrying maker's guarantees

THE

JEWAL

USED MACHINE DIVISION OUNDLE ROAD ORTON LONGUEVILLE PETERBOROUGH

Telephone: Peterborough 67116/7

Landis 10in. × 24in. Type "C" Universal Grinder. Internal Attachment. New condition

Further details from:—
C. & G. OLDFIELD, LTD.,
15, Abercorn Street,
PAISLLY.

Rowland Duplex Face Grinding machine. Series 6600M., two heads opposed with 24in, dis. wheels. Max. distance between 9in. Each head driven by two 40 h.p. motors. 400/8/50. Hydraulic feed pump and 2 to 3 h.p. motors. 400/8/50. Hydraulic wheel dresser, control box and Allen West starter, overall size 11it. × 8ft. × 7ft. high. This machine is ideal for facing two sides of a component with double dimensions such as a con rod, large and small end bearing facing.—BOX C577. MACHINERY, Clifton House, Euston Road, N.W.1.



MACHINERY CO., LTD.

176/178, Victoria Road, Acton LONDON, W.J. ACOrn 8881

BORERS AND DRILLS

KEARNS Model OA Horizontal Borer, 24in. dia. spindle × Ift. 6in. traverse. Speeds (16) 25-1,000 r.p.m. Main table 2ft. 0in. × 2ft. 9in. Revolving table 2ft. 0in. × 2ft. 9in. Longitudinal traverse 2ft. 0in. Transverse 2ft. 0in. Vertical Ift. 4in. IN EXCELLENT CONDITION. HAS HAD VERY LITTLE USE.

GRINDERS

BROWN & SHARPE No. 2 Surface

Grinder.
STUDER Model PSMI50 Profile Grinder.
This machine is in excellent condition.
LANDIS Plain Cylindrical Grinder, 6in. X

IBin.

HORSTMAN Thread Grinder, capacity
Sin. dia. × 9in. B.C.

NOVOMATIC "A" Internal Grinder.
Fully automatic sizing, three spindles
15,000 r.p.m., 25,000 r.p.m., 35,000 r.p.m.
Swing Bin. with guard in position.

ATHES, CAPSTANS, AUTOMATICS

WARD 7 Combination Turret Lathe.
CARDIFF 7in. × 36in. between centres.
BROADBENT 12 Centre Lathe × 72in.
between centres, swing 42in., 4jin.
hollow spindle, speeds 11-375, 124 h.p.,
Motor, Timken Roller Bearing Head-

BOYES & EMMS S.S. & S.C. Lathe, centre

height 16in. × 7ft. 6in.

HERBERT No. 20 Comb., spindle bore
7in., speeds 5-201.

ROLLO 64 Centre Lathe.

HERBERT No. 9 Combination Turret

Lathe.

SWIFT Hydraulic Copying Lathe, 36in.

swing × 5ft. 6in. between centres, 30 h.p.

MILLERS

CINCINNATI I-18 Production Miller. KENDALL & GENT Vertical Miller, table 69in. × 19in., speeds 20-300, rapid

ARCHDALE 28in. Horizontal Mille

ARCHDALE 28in, Horizontal Miller.

**ACEM Vertical Miller, table 33/in. ×
10in. Speeds 90-785 r.p.m. Traverses:
long. 20/in. Spindle vertical 4in.

**BROWN & SHARPE No. 2 Vertical Mill,
table 54in. × 14in., speeds 30-1,200 r.p.m.

**Power down feed to head.

**SCHIESS DEFRIES Vertical Keyseater.

PRESSES, SHAPERS, PLANERS AND HOBBERS

AND HOBBERS
ESSEX No. 32 Punch Shaper.
30-ton RASKIN Double Sided Double
Geared Drawing Press. Area 20in. x
23in. Draw 44in.
MAXICUT High Speed Gear Shaper,
max. dia. 7in. x 2in. face.
New POREBA Model HDA.80 Planer,
capacity 10ft. x 32in. x 30in. table,
drive by Held gearbox.
14in. NEWEY Shaper.
DOWDING V8 Gear Hobber. Maximum
pitch in steel one cut 14 D.P., in soft
metals cut 12 D.P. Maximum dia. 0in.
8in. No. of teeth cut 6-400. Length of
hobbing traverse 74in. Hob spindle
speeds (10) 61-246 r.p.m.

MISCELLANEOUS/

CIRCULAR Graduating Machine for English, metric and degree graduations.

machine tools ING BELLS for

NEW DENBIGH 24in. Back Geared High Speed Drill. Cap. up to 1½in. in steel. No. 3 M.T. M.D. 400/3/50. In stock Now.

NEW MANCHESTER Rapidor Light Duty Hacksaw. Cap. 6in, by 6in. M.D. 400/3/50.

NEW MANCHESTER Rapidor Medium Duty Hacksaws. Cap. 6in. by 6in. M.D. 400/3/50. In stock now.

REARNS OA Horizontal Borer. Built 1943. With top table 36in. square; 2½in. travelling spindle and 14in. dia. facing head. M.D. 400/3150.

JONES & SHIPMAN Fig. 310 Tool and Cutter Grinder. Cap. 8in. by 16in.; using tailstock centres admits 19in. length. Working surface of cable 29in. by 4in., workhead and wheelhead swivel also elevation to wheelhead.

WILLSON 7½in. S.S. & S.C. Gap-bed Lathes. Swings 15½in. over V-bed and 26in. in gap. Admits 36in. between centres. M.D. 400/3/50.

CINCINNATI No. 5 H.P. Miller. Table 83in. by 21in. Long traverse 50in. 20 H.P. 83in. by 21in. Motor 400/3/50.

STEDALL Plain Horizontal Miller. Table 15in. by 4½in. Power traverse 8in. M.D. 15in. by 4\(\frac{1}{4}\)in. 400/3/50.

FRITZ WERNER 8101 Manufacturing Miller. Table 35in. by 12in. approx. Speeds 45-2,240 r.p.m.

ARCHDALE 30in. Vertical Miller with Power Operated Rotary Table. Table 47in. by 14in. M.D. 400/3/50.

MILWAUKEE 2K Vertical Miller. Table 56in. by 12in.; long. traverse 28in. 24 speeds 15-1,500 r.p.m. Power all ways including head. M.D. 400/3/50.

HILMOR Type C.2 Hand Operated Pipe Bender. Heavy Duty Non-Mandrel type. Cap. in steel up to 3in. outside diameter by 14's gauge. With 22 formers and 16 guides.

Hand Operated Shear and Angle Cropper. Cap. Iin. and I\(\frac{1}{2}\)in. rounds. I\(\frac{1}{2}\)in. squares, 3in. by 3in. angles. Shear blade 9in. long. With ratchet on operating lever. Mounted on wheels.

ALBA 10in. Crank Shaper. Swivelling table 10in. by 7½in deep. M.D. 400/3/50.

MILLS 15 ton Hydraulic Straightening Press. With Double rail straightening equipment. M.D. 400/3/50.

EDWARDS No. 3 Circle Cutting Machine. Hand operated for circles from 4in. to 29in. dia. in 16's gauge M.S.

Several HERBERT No. 4 Capstan Lathes

CINCINNATI 4/36 Duplex Hydromatic Miller. Table 54in. by 16in. Admits approx. 22in. between spindles. Speeds 20-150 r.p.m. by P.O. gears. Single cycle.

BELL (Machine Tools) D. Walter Street, LEEDS

~EDWARDS ~~~

BLISS No. 19 size Inclinable Power Press with single R. to L. roil feed. Pressure exerted approx. 14 tons. Stroke #in. Bed 17in. × 0+in. Hole in bed 9in. × 5in. Width of feed rollers 4in. Length of feed variable from 0 to 2+in. Weight approx. 13 cwt.

TWO NEW LEM. 25/220 High Speed Open Fronted Inclinable Power Presses. With adjustable stroke. Motorised for 400-440/3/50 supply. Pressure exerted 25 tons. Depth of throat 8 #in. Table 16iin. × 22 #in. Hole in table 3+in. Stroke adjustable from 4in. to 3 #in. Weight approx. 35 cwt.

TWO NEW LEM. 40/250 Open Fronted Inclinable Power Presses. With adjustable stroke. Motorised for 400-440/3/50 supply. Pressure exerted 40 tons. Depth of throat 94in. Motorised for 400-440/3/50 supply. Pressure exerted 40 tons. Depth of throat 94in. 15 in. × 25 #in. Ede in table 3in. Tablemeter, Weight approx. 56 cwt.

TAYLOR & CHALLEM Size No. 34, G.D.P. Double Sided Geared Double Action Cam Action Drawing Press. Motorised for 400-440/3/50 supply. Spring balanced blank-holder, Punch stroke 2in. Blankholder stroke 5in. Between uprights 22in. Bed 20in. × 18in. Hole in bed 94in. diameter. Weight approx. 55 cwt.

55 cwt.

RHODES Open Fronted Upright Bench Punching
Press. Motorised for 400/3/50 supply. Pressure exerted approx. 2 tons. Stroke in.
Adjustment to table in. Table 9in. × 4in.
Hole in table 1in. × 3in. Weight approx.

Hole in table 1lin. × 3lin. Weight approa34 cwt.
FOUR BLACKBURN & CRAWSHAW. Power
Operated Ceared Rotary Shearing Machines.
Capacity 4in. thick. Dept's of gap 204in.
Cutters, dia × thickness 54in. × 4in. Cutting
speed 51ft. 6in. per minute. Arranged motor
drive 400/8/50.

BESCO Double Geared Hand Operated Universal
Swing Beam Folding Machine. Capacity
6ft. 2in. × 4in. Adjustable for sharp and
round bends. With adjustable stop for repetition bending and adjustable back gauge.
Weight approx. 56 cwt.

Photographs of the above are available.

Photographs of the above are available.

VERY FAVOURABLE HIRE OR HIRE PURCHASE TERMS CAN BE OBTAINED. MACHINE TOOLS, NEW AND USED. Of Every Description. Attractive Prices.

F. J. EDWARDS LTD.,

359-361, EUSTON RD., LONDON, N.W.I Telephone: EUSton 5000 Telex. No. 24264

Corona Heavy Duty Vertical Drilling Machine. No. 5 Morse Taper Drilling Machine. Excellent condition.

Further details from:

C. & G. OLDFIELD, Lad.,
15, Abereorn Street,
PARLEY.

NEW MACHINES EARLY DELIVERY

COLCHESTER, MASCOT. TRIUMPH & STUDENT LATHES

WILLSON Mk. V lathes.

KERRY AG2 5½ lathes.

MYFORD Super 7 lathes.

DENBIGH D4 milling machines.

VICTORIA U2 rapidmil.

PROGRESS 3A pillar drill.

Q & S 6in. and 8in. hacksaws.

Gordon Try Ltd

THE CAUSEWAY, EGHAM, SURREY

Tel: Egham 4166/7

Victory Copying Machine. 45in. For blue and dye line prints with develop-ing unit.—WILCOX & CO. Barr Street, Birmingham 19 NORthern 1234/5.

6in. RPA 8 Spindle Gridley Chucking Auto complete with Chucks, Cams. Tool Slide Holders, etc. Fully motorised. Excellent condition.

Further details from:—
C. & G. OLDFIELD, Ltd.,
15. Abercorn Street,
PAISLEY.

Kearns Model O.C. Horizontal 389-361, EUSTON RD., LONDON, N.W.,
Telephone: EUSton 5000 Telex. No. 24264
And at Lansdowns House, 41, Water St.,
Birmingham, 3. Telephone: Central 760-68
House of the Hunt Lansdown House, 41, Water St.,
Birmingham, 3. Telephone: Central 760-68
Hunt Lansdown House, 41, Water St.,
Birmingham, 3. Telephone: Central 760-68
Hunt Lansdown House, 41, Water St.,
Birmingham, 3. Telephone: Central 760-68
Hunt Lansdown House, 41, Water St.,
Birmingham, 3. Telephone: Central 760-68
Hunt Lansdown House, 41, Water St.,
Birmingham, 3. Telephone: Central 760-68
Hunt Lansdown House, 41, Water St.,
Birmingham, 3. Telephone: Central 760-68
Hunt Lansdown House, 41, Water St.,
Birmingham, 3. Telephone: Central 760-68
Hunt Lansdown House, 41, Water St.,
Birmingham, 3. Telephone: Central 760-68
Hunt Lansdown House, 41, Water St.,
Birmingham, 3. Telephone: Central 760-68
Hunt Lansdown House, 41, Water St.,
Birmingham, 3. Telephone: Central 760-68
Hunt Lansdown House, 41, Water St.,
Birmingham, 3. Telephone: Central 760-68
Hunt Lansdown House, 41, Water St.,
Birmingham, 3. Telephone: Central 760-68
Hunt Lansdown House, 41, Water St.,
Birmingham, 3. Telephone: Central 760-68
Hunt Lansdown House, 41, Water St.,
Birmingham, 3. Telephone: Central 760-68
Hunt Lansdown House, 41, Water St.,
Birmingham, 3. Telephone: Central 760-68
Hunt Lansdown House, 41, Water St.,
Birmingham, 3. Telephone: Central 760-68
Hunt Lansdown House, 41, Water St.,
Birmingham, 3. Telephone: Central 760-68
Hunt Lansdown House, 41, Water St.,
Birmingham, 41, Wate

CINCINNATI Model EA, 18in. × 6in. Plain

Grinder.

TRIDENT 18in. × 6in. Surface Grinder.

SCHUTTE Tool, Cutter and Surface Grinder.

JONES & SHIPMAN 4in. × 10in. Semi
Universal Grinder.

CENTEC 2A Universal Miller with Vertical

CERTIEU 23 VANA VANA Attachment IV Vertical Miller.
RICHMOND MVI Vertical Miller.
REED PRENTING 2V Vertical Miller.
REED PRENTING 2V Vertical Miller.
PEARN RICHARD'S Horizontal Boring and
Facing Machine, 10ft. Facing head to

Facing Rascume, 10tt. Facing Read to Boring stay, 150 ton 10tt. * † Press Brake, with Fraser Mono Radisl. * 50 h.p. pumping unit. Two TAVANNES Single Spindle Automatics. Type M60. Bar capacity 2 in. Max. turning length 8 in. About 4 years old.

turning length \$\frac{8}{1}\text{in}\$. About 4 years oldHaif new price. **KOLB** KZI Spur and Helical Gear Grinder.
Up to \$\frac{12}{1}\text{in}\$. dis. As new. **ABRASIVE** No. 3 Horizontal Spindle
Surface Grinder. \$\frac{2}{1}\text{in}\$. x \text{sin}\$. capacity. **GISHOLT** \$\frac{3}{1}\$. Combination Turret Lathe. **4\text{in}\$**. holiow spindle. 10 h.p. motor. **WICKMAN** MOULTON ATM! Thread **Miller**, Max. dis. milled \text{6in}\$. external,
\$7\text{in}\$. internal. Distance work and

cutter spindle \$\frac{4}{1}\text{in}\$. **TAYLOR** & CHALLEN 60 Ton Rigid

Fixed Stroke Power Press. **HULLER** UG3 Radial Arm Tapper.

FRYE MACHINE TOOL CO. LTD., POYLE ROAD, COLNBROOK, BUCKS.

Telephone: Colnbrook 2442.

Cleveland 21A Single Spindle Auto new 1942, complete with all Equip-ment including Third Slide.—Further details

C. & G. OLDFIELD, LTD., 15, Abercorn Street, PAISLEY.

24in. Alba 68 Shaping Machine, with s.c. motor, 400-440/8/50, 6 ram speeds 8-72 s.p.m. Table 23in. x 18in., 27in. long, traverse. Overhauled (ready.—LEE & HUNT, LTD., Crocus Street, Nottingham. Phone: 84246.

Apr

LAND

AUTOMATICS

BULLARD "Mult-Au-Matic" 8 spindle

BORING MACHINE

WEBSTER & BENNETT 24in. swing "Duplex" Vertical Borer.

BANDSAW

THIEL No. 17 Metal Bandsaw.

CROPPING MACHINE

Angle Cropping Machine. Cap. up to 6in. × fin. angles.

DRILLING MACHINES

POLLARD 13in. Pillar Drill. No. 2 Morse Taper. R. & F. Table 11in. × 11in. ARCHDALE 28in. H/Duty Pillar Drill. TOWN 6ft. Radial Drill. Box table.

GRINDING MACHINES

ELB 24in. × 8in. Hydraulic Surface Grinder. Non-electric mag. chuck.

NEW NORTON 10in., 12in., 14in., 16in. and 20in. D/E Tool Grinders

CAPSTAN AND CENTRE LATHES

HERBERT 9 Combination Turret Lathe. HENDEY 9in. S.S. & S.C. Lathe. 12 speeds 14 to 478 r.p.m. Taper turning 4ft. 6in. between centres.

LANG 104in. × 5ft. S.S. & S.C. Gap Bed Lathe.

HAMMER

MASSEY 5 cwt. Slide Type Pneumatic Hammer. 400/3/50.

MILLING MACHINE

RICHMOND H.2 Horiz. Miller. Table 35in. × 9in.

PRESSES

BRADLEY & TURTON No. 3 Flypress. SWEENEY & BLOCKSIDGE Bench Press. Cap. 3 tons.

SCREWING MACHINE

KENDALL & GENT 3in. Screwing Machine. crew Type

SHAPING MACHINE

WOTAN 27in. Stroke Hydraulic Shaper.

POLISHING MACHINE

3 and 5 h.p. Polishing Spindles.

All machines 400/3/50 electrics unless otherwise stated.

THE MIDLAND MACHINE TOOL CO.

BRADLEY, BILSTON, STAFFS.

Tel.: Bilston 42471/9.



No. 2 D.F. SCRIVENER Centreless Grinding

Machine.

2A WARD Capstan Lathe.

36in. × 10in. FRITZ WERNER Vertical Milling Machine, swivelling head.

18 CINCINNATI Plain Miller.

P.24 SNOW Surface Grinder. New-Bin. GEMINIS Toolroom Lathe, without

P.24 SNOW.

New—Bin, GEMINIS Toolroom Laboration

Copying Attachment.

Two JONES & SHIPMAN Model 540

Hydraulic Surface Grinders. Table size 6in.

X 18in. Automatic and hand longitudinal traverse 19in. Table speeds 5-40ft. per min.

3 years old. Motorised 40013150.

No. 2 WARNER & SWASEY Chucking

Constan.

Capstan.
2SS. HERBERT Bar Feed Capstan Lathe.
4ft. ASQUITH Universal Drill. Portable.
6ft. × Acin. BENNIE Guillotine. Heavy Duty.
8\fin. LANG S.S. & S.C. Lathe, 4ft. between

Centres.
36in. × 10in. FRITZ WERNER Plain Miller.
New 7in. WOODHOUSE & MITCHELL
Type 70 Junior Lathe.
60in. JACKSON & BRADWELL Balancing

20in. ARCHDALE Plain Milling Machine. Power feeds and rapids.
in. HerBert Pedestal Drill.
in. HOLBROOK Toolroom Lathe.
4in. BUTLER Slotting Machine. Circular

table

table.
8 Jin. FABIUS Lathe, 5ft. between centres.
(New.)
Model HBY CHURCHILL Internal Grinder.
No. 3 KITCHEN & WADE Vertical Honer.
27in. WOTAN Hydraulic Shaper.
Idin. BLANCHARD Rotary Surface Grinder.
New PASQUINO Vertical Mill. Swivel

head, power feeds and rapids. ew 351in. ZERBST Lathe, 10ft. 4in. between

10in. × 40in. MIKROMAT Hydraulic Surface Grinder.

o. 2 WARNER & SWASEY Chucking

No. 2 WARNER
Capstan.

Zin. x Sin. ABRASIVE Model 3B Surface
24in. x Sin. ABRASIVE chuck. As new. Grinder, with magnetic chuck. As new.

New LAGUN 49in. × 12in. Universal Miller,
with dividing heads and universal attachment. Power feeds and rapids in all directions. £1,250.

DIMCO (Gt. Britain) LTD. 28, Wood Lane, SHEPHERD'S BUSH. LONDON, W.IZ.

SHEpherds Bush 4401/2.

Kearns No. 2 Horizontal Boring and Facing Machine, complete with Restay. A.C. Motor.
Further details from:—
C. & G. OLDFIELD, Ltd.,

15, Abercorn Street, PAISLEY.

chine, model 130. Max. dla. 8in. × 16in. between centres. Travel 8in. Machine constant 12. Max. nob dla. DP.4 in steel. Electrics 400/3/50. Drive 3 h.p. motor. Rapid traverse motor 1 h.p.—ROLLS TOOLS, LTD., Pyrford Road, Pyrford, Woking, Surrey, or 'phone Byfleet 43252. Cleveland Gear Hobbing Ma-

Cincinnati No. 2 Plain Horizontal Milling Machine, Dial type. Med. speed. Dual controls. 3-way Rapid Power Traverse.—BOX C702, MACHINERY, Clifton House, Euston Road, N.W.I.

Alba 6S Shaper, 24in. Stroke, self-cont. Mot. 400/8/50 switchgear, inch-ing button, etc., 6 speeds, vice, good cond.— C. L. THOMAS LTD., Stirling Road, Solthull.

For Sale—One Herbert 9A Turret lathe, also one Thiel punch shaper.—BOX C799, Machinery, Clifton House, Euston Road, N.W.1.

DOUGLAS OF HIGH WYCOMBE

NEW MACHINES FOR EARLY DELIVERY

DRILLING MACHINES

PROGRESS 3E 11in. Pillar Drill (April). PROGRESS 4-Spindle Drill (April). ARBOGA ER1830 Radial Drill (March). RICHMOND HB3/12 4ft. 6in. Arm Radial (April)

GRINDING MACHINES

GHIRANGELLI A50 Centreless Grinder MYFORD MG12 Cylindrical Grinder (April). BURDETT No. 70 18in. × 6in. Surface Grinder (June). ABWOOD SGIA 18in: × 6in. Surface Grinder.

LATHES

(April).

BOXFORD AUD 41in. S.S. & S.C. Lathe (June). COLCHESTER Chipmaster 5in. Lathe (Nov-COLCHESTER Student 6in. Lathe (July). COLCHESTER Triumph 7½in. Lathe (May). CROWTHORN 7½in. Lathe (August). HARRISON 64in, Lathe (April). KERRY AG2 5fin. Lathe (July). MYFORD Super 7B 34in. Lathe (March). WILLSON 64in. Bed Capstan Lathe (April). WILLSON 74in. Newel Lathe (April). WILLSON 74in. Newel Mk. V Lathe (April). WOODHOUSE & MITCHELL 7in. 70
Junior Lathe (July).

MILLING MACHINES

ABENE VHF3 Combined Horizontal and Vertical Mill (April). ARBOGA EM825 Vertical Mill (June). **DENBIGH** D4 Horizontal Mill (May). SENIOR MI Plain Mill (April). VICTORIA UO Universal Mill (May). VICTORIA U2 Universal Mill (July). VICTORIA U2R Universal Rapidmil (May). VICTORIA V3 Vertical Mill (April). VICTORIA TVI Turret Mill (April). VICTORIA TV2 Turret Mill (April). WOODHOUSE & MITCHELL Turret Mill 369 (July). ZBROJOVKA FA3V Vertical Mill (April).

SAWING MACHINES

SPEEDAX 16in. Bandsaw (May). SPEEDAX 20in. Bandsaw (May). VELOX 10in. Hacksaw (March). Q. & S. 6in. Cap. Hacksaw (March). WICKSTEED 8in. Cap. Hydramatic Hacksaw WICKSTEED 10in. Cap. Hacksaw (April).

THIS LIST DOES NOT INCLUDE MACHINES THAT ARE AT PRESENT IN OUR SHOW-ROOMS AT HIGH WYCOMBE. WHY NOT VISIT US TO INSPECT OUR RANGE?

A. DOUGLAS CO., LTD., LINCOLN ROAD,

CRESSEX INDUSTRIAL ESTATE, HIGH WYCOMBE, BUCKS. Tel.: High Wycombe 4390 (5 lines).

arry Kirk

ad the following modern quality machines from STOCK

AUTOMATICS

BULLARD 8in. Mult-au-Matic, 6 spindles

RYDER Verticalauto, capacity 16in. swing × 8in., 6 spindles

BORING MACHINES

WEBSTER & BENNET 36in. Vertical Borer.
RICHARDS 36in. Vertical Boring Mill
complete with side head.

JONES 6in. Spindle Horizontal Borer-Table 17ft. 6in. × 8ft. Spindle travel 48in. Rapid traverse 84in. per min. Motorised 400/3/50. Weight 70 tons.

SCHARMANN 3in. Sliding Spindle Horizon-tal Boring Machine, equipped with facing head and screwcutting.

BULLARD 36in. Vertical Boring Mill. Machine. 14in. stroke. Compound table.

SOHIESS Vertical Boring Mill, 39in. dia. of table. Maximum awing 48in. S.C.M.D. 35 h.p., 400/3/50.

GRINDING MACHINES

HEALD No. 172 Gap Bed Internal Grinding Machine, maximum diameter of com-ponent 36in.

BILLETER Hydraulic Open-side Slideway Grinding Machine, capacity 47in. × 12in.

LATHES

NOBLE & LUND Heavy Duty Centre Lathe, 22in. centre height × 29ft. between centres. Max. swing over saddle 33in. dia.

HARVEY Heavy Duty Centre Lathe, 42 in. centre height × 52ft. between centres. Max. swing over saddles 65in. dia. CRAVEN S.S. & S.C. Centre Lathe, 13 in. centre height × 65ft. between centres.

CRAVEN S.S. & S.C. Centre Lathe, 13in. centre height × 31ft. 6in. between centres. HERBERT No. 11 Combination Turret

MILLING MACHINES

ARCHDALE 30in. Vertical Milling Machine. COLLET & ENGLEHARDT Keller Type
Die Sinking Machine. Model FKf80,
capacity 60in × 30in.

PLANING MACHINES

CLEVELAND Openside Planing Machine, capacity 10ft. × 2ft. 6in. CINCINNATI Planing Machine, capacity 8ft. × 2ft. 6in.

MISCELLANEOUS MACHINES

CLIFTON & BAIRD Horizontal Cold Sawing Machine, 30in. dia. Saw. Maximum capacity 22in. × 7in. R.S.J.

BUTLER 18in. Stroke Slotting Machine. Hydraulic Vertical Internal Honing Machine (manufactured by PETER WOLTERS), Capacity 0.2in. to 2in.

RAPIDAN Double Helical Gear Generating Machine, 12in. diameter capacity.

Further details from

HARRY KIRK ENGINEERING LTD.,

BRANDON ROAD WORKS, BRANDON ROAD, COVENTRY.

WALSGRAVE-ON-SOWE 2253 (6 lines).

G. A. ROBINSON (STOKE-ON-TRENT) LTD.,

HARTSHILL,

STOKE-ON-TRENT, STAFFORDSHIRE Tel.: Newcastle (Staffs.) 64771 (5 lines).

COVENTRY BRANCH:

14/16, Queen Victoria Road, Tel.: Coventry 25418 and 26221.

USED AND RECONDITIONED MACHINE TOOLS AT BARGAIN PRICES

New BRITAIN GRIDLEY Model 60, 6 spindle Auto. 1in. capacity. Full Equip-

ment.
FOOTEBURT Single Spindle Auto., 14in.
capacity, Full Equipment.
HERRERT 48E, Electric Head. Covered
Bed, Auto. Feeds all round.
HERRERT 48, Steel Tray. Well equipped,
arranged for Chucking.
HERRERT 4, Cast Iron Tray. Good condition Collet Chuck.
Covered Bed, Power
Feed Turret, Saddle, Cross Sitie.
WARNER & SWASEY No. 6 Capetans. Full
Equipment

Equipment.
CINCINNATI (As New) Plain Grinder, 10in.

× 36in.

SCRIVEN H/D 8ft. × žin. Plate Guillotine.

COHEN Bending Rolls, 8ft. × žin. Push
Button Controlled.

Button Controlled.

U2.40in. × 10in.,

COHEN Bending Rolls, 8ft, × ½in, Push Button Controlled.

PALLAS Universal Miller, U.2, 40in. × 10in., All Geared, Power Traverse all round.

ASQUITER Vert., 28in., Table 49in. × 14in., Silding Head, Power Feed all round.

AGAB New Wood Turning Lathes. Full Equipment. (Half New Price.)

CINCINNATI No. 4 Plain Power Feeds, Dial Type, Spindle Speeds 18f1,300 r.p.m.

CINCINNATI 5/48 Hydromatic (As New).

CHURCHILL REDMAN 24in. Toolroom Shaper (As New).

POLLARD CORONA, Pedestal Driller, Model 28A, No. 4 Morse, Spindle speeds 30-295 f.p.m.

Model 28A, No. 4 Morse, Spindle speeds 30-295 r. p.m.

HERBERT 2-spindle, All Geared Head on 3-spindle Pedestal Base, Table 36in. × 15in., 4tted No. 3 Quick Change Chucks, Spindle Speeds 104-562.

HERBERT 2-spindle Pedestal Driller.

BENDING ROLLS, 8ft. × fin. Capacity, Fully Motorised, Push Button Operated.

HODES Press Brake, 10ft. × iln., Motoriaed, Overrauked.

RHODES Press Brake, 10ft. × iln., Motorlased, Overcranked.
RHODES Press Brake, 8ft. × iln., Motorfried, Undercranked.
RHODES Multi Punching Machine, Single
Pulley Drive, 5ft. capacity.
RHODES Multi Punching Machine. 10ft.
capacity. Undercranked, Motorised.
Capacity. Undercranked, Motorised.
5ft. × iln., Single Pulley Drive.
5ft. × iln., Single Pulley Drive.
EDWARDS Bending and Folding Machine.
Motorised, 5ft. × iln.
RHODES Multi Punching Machine, Motorised, 5ft. capacity.

RHODES Multi Punching Machine, Motoriged, 5ft. capacity.
RHODES Bending and Folding Machine, 4ft. × im. capacity, Single Pulley Drive.
RHODES Bending and Folding Machine, 4ft. × im. capacity, Single Pulley Drive.
RHODES Multi Punching Machine, Single Pulley Drive.
RHODES Multi Punching Machine, Single Pulley Drive.
REMDEMOE Fower Guillotine, 4ft. × 14s

Gauge. POWER GUILLOTINE, 7ft. 6in., 14s.

Gauge.
POWER GUILLOTINE, 6ft., 14s Gauge.
BESCO 75 Ton, D'sided, Inclinable, 4†in.
Stroke, Motorised, 4tted with Udal
Guards, Platen 27in. × 27in.
BESGO 12 ton, Open Fronted Press, 1†in.
Stroke, Inclinable, Motorised, complete
with Udal Guards.

THESE MACHINES CAN BE INSPECTED AT ANY NORMAL BUSINESS HOURS AT OUR STOKE-ON-TRENT BRANCH.

No. 61A Fellows M/d Automatic Gear Shaping Machine to cut spur gears up to 18in. dia. × 5in. face external, 3in. dia. internal, 3-4 D.P.—LEE & HUNT, L/TD., Crocus Street, Nottingham. Tel.: 34246.

to see the range of FINE MACHINE TOOLS of B. ELLIOTT (MACHINERY) LTI

VICTORIA WORKS, LONDON, N.W.SO Tel. ELGAR 4000

New Britain Gridley Automatic, model 60, 6-spindle, 1in. capacity, for sale.

—BOX C766, MACHINERY, Clifton House,
Buston Road, N.W.1.

National Acme Gridley 11in. capacity 6-spindle Automatic for sale.—
BOX C772, MACHINERY, Clifton House, Euston
Road, N.W.1.

One Secondhand Scrivener No. 1 Centreless Grinding Machine, maximus capacity 14in. diameter with Plunge Fed Hand Operated. Motorised 400-440/3/50.

C. & G. OLDFIELD, LTD., 15, Abercom Street, PAISLEY

Loewe Boring and Facing Lathe, high speed machine, 475 to 3,000 r.p.m. Swing 16in. Multi-speed motor, 400/3/50.— BOX C606, Machinery, Clifton House, Euston Road, N.W.1.

B.S.A. Type R.A. Gridley 6-spindle Automatic. 1½in. capacity. Universal threading attachment. 5th position parting off slide, Late type machine with equipment. 400/8/50. Excellent condition.

AOME Type R.A. Gridley 6-spindle Automatic. 1½in. capacity. Universal Threading on 4th and 3rd position, 5th position, parting off slide, excellent condition, with considerable equipment. 400/8/50.

BROWN & SHARFE No. 2 Surface Grinding Machine. 18in. × 6in. capacity. 7in. dis. wheel. 400/8/50.

BHODES No. 25 Dower Press. Fitted fixed fixtoke 4in. Table 44in. × 36in. Motorised 400/8/50.

HM.E. Type C.26 Double Sided, Double Added, Double Sided, Search, Motorised 400/8/50.

HM.E. Type C.26 Double Sided, Geared, Power Press. 100 tons pressure, 5in. stroke, Bed area 24in. × 22in. Between sides 24in. Motorised 10 h.p. 400/8/50.

New PLANKERS OF HUDDERSFEELD Sit. × 2ft. 6in. × 2ft. 6in. Planing Machine. 2 tool boxes on cross rall. Solenoid control. Lancashire Dynamo Drive and Control Gear. 1944 machine. 1 tool boxes on cross rall. Solenoid control. Lancashire Dynamo Drive and Control Gear. 1944 machine. 1 tool boxes on cross rall. Solenoid control. Lancashire Dynamo Drive and Control Gear. 1944 machine. 1 tool boxes on cross rall. Solenoid control. Lancashire Dynamo Drive and Control Gear. 1944 machine. 1 tool boxes on cross rall. Solenoid control. Lancashire Dynamo Drive and Control Gear. 1944 machine. 1 tool Sided, Ungeared, Power Press. 45 tons pressure, 2½in. stroke, Bed area 34in. × 37in. Between sides 34in. Motorised 400/8/50. Departor's guards. 400/8/50. Operator's guards. 1000 pressor guards. 1

STANCROFT LTD.

LANCASTER STREET, BIRMINGHAM, 4.

ASTon Cross 2235.

Apr

BOI KE BRC CAF HMH

DRI

H.

SER

FOI

S/ M Pl

SUH

CELLIST

**

REBUILD WARD CAPSTANS

35 GREENWICH CHURCH ST. LONDON. S.E.10

EXCHANGE MACHINES AVAILABLE

ACBARS LIMITED. 57a, HOLBORN VIADUCT, LONDON, E.C.I.

Telegrams: Acfirb Cent. London

AVAILABLE FROM STOCK

All machines listed below are at our Works in Sutherland Walk, Wal-worth Road, S.E.17

BROACH

FORST RIAS Universal Vertical Broach for internal and surface broaching, 5 tons, 39 jin. stroke. 1952 machine.

RADIAL DRILLS

New VOEST Swivel Head Radial, Iin. capacity, 3ft. 3in. radius. CERUTI Type TNC60 5ft. 8in. Heavy Duty Radial. 1952 machine.

GRINDERS

BROWN & SHARPE No. 2 Surface.
GRAND RAPIDS 18in. × 6in. and 24in. × 10in. Hydraulic Surface Grinders.
MOPCO 39in. × 11in. Hydraulic Surface Grinder, with inclinable spindle for horizontal or vertical grinding.
CHURCHILL 10in. × 24in. Universal.
LANDIS 12 × 48 Universal.
BROWN & SHAPRE No. 3 Universal.
NORTON 14in. × 36in. Universal.
NORTON 14in. × 36in. Universal.
NEWALL 10U Universal Lapper.

CAPSTAN AND TURRET LATHES

GISHOLT IL Turret Lathe. FOSTER No. 2B Turret Lathe.

CENTRE LATHES

WARD, HAGGAS & SMITH 84in. Gap Bed, 36in. between centres. CROMWELL 31in. Precision. CARSTENS-SWISTEN 5in. Precision.

MILLERS

ARCHDALE 14in. Manufacturing type. KENT-OWENS 1-8 and 1-14 Hydraulic

KENT-OWENS 1-8 and 1-14 Hydraulic Production.
SUNDSTRAND No. 0 Rigidmill.
CUTTAT 15-412 HYPERMILL Kneeless Production. Traverse 47±in. Table size 66±in. x 15±in. 15 h.p. Motor. 1952 Machine.
GRAFFENTADEN FHI21 Plain Horizontal with Universal Vertical Head. Table size 59±in. x 13±in. 1952 Machine.
HERBERT 23V Vert. Table 68±in.x 17±in. 48±in. traverse.

A8in. traverse. REED PRENTICE No. 6 Heavy Duty Vert. Table 84in. x 20in. 72in. traverse. HOLROYD TII7 Thread Miller. HELLER Automatic Thread Miller (4). ASQUITH HKO Duplex Keyseater.

V & O No. 11 Double Action. Approx. 10 tons. Roll feed. Max. draw lin.

All machines motorised 400/3/50 unless otherwise stated.

THE SPOT TO WATCH!

FOR GOOD CLASS SECONDHAND MACHINES AT LOW COST

BROWN & SHARPE 2G Auto. Ser. No.

8314.

BROWN & SHARPE OG Auto.
LIBBY 4R Capstan.
TIMBREL & WRIGHT in. Capstan.
JONES & SHIPMAN Hispd. Bench Drill.
ARCHDALE 36in. Radial Drill.
FOSDICK 3 Sp. Drill.
FOSDICK 5 Sp. Grider.
BROWN & SHARPE No. 5 Plain Grinder.
SCRIVENER ICA Centreless Grinder.
SCRIVENER FICA Centreless Grinder.
Controlled Cycle

SCRIVENER NO. 1 CONTROLLED CYCLE
Centreless Grinder.
SMART & BROWN Internal Grinder.
PRECIMAX 6in. by 12in. Plain Grinder.
DRUMMOND MAXICUT No. 2 Gear

TRIUMPH Centre Lathe.
WARNER & SWASEY 2A Turret Lathe.
LEBLOND No. 15 RP Lathe.
ADCOCK & SHIPLEY '0'—I and No. 3

YAN NORMAN Plain Mill.
YAN NORMAN No. 3 Uni Mill.
MILWAUKEE Simplex 12/24 Mill.
CINCINNATI Mod. 08 Vertical Mill.

CENTEC No. 2 Milling M/c.
KELLER 1210 Diesinking Machine.
CINCINNATI HYDROTEL 28in. Vertical

Mill.

MOREY 12M 2 Sp. Profiler.

TAYLOR & CHALLEN 1 B Press.

GISHOLT Super Finisher.

MICROFLAT Honing Machine.

KITCHEN & WADE No. 2 Honing Machine.

SENTINEL 25 T. Power Presses.

SENTINEL 12 ton Power Presses.

H.M.E. Model L. 6 Power Presses.

H.M.E. Model L. 6 Power Presses.

HERBERT Flash Tapping Machines.

LATE AMERICAN MACHINES GLEASON 3in. Str. Bevel Gear Generators. GLEASON 12in. Str. Bevel Gear Generators. FELLOWS 7125 High Speed Gear Shaper. FELLOWS 72 High Speed Gear Shaper. FELLOWS No. 7 High Speed Gear Shaper. FELLOWS 75A High Speed Gear Shaper. FELLOWS 61A Gear Shaper. HEALD 72A3 Internal Grinder. GLEASON No. 16 Spiral Bevel Hypoid Gear Generator.

K. & T. 5H Plain Mill.

All machines motorised 400/3/50 unless otherwise stated.

GOOD USED MACHINE TOOLS WANTED

JONES MACHINE TOOLS LTD. 48 HIGH STREET, EDGWARE, MIDDX. PHONE EDGWARE 4488/9

78 WRENTHAM STREET BIRMINGHAM 5, Phone Midland 5593

New Rhodes 10ft. × 1/1n. Fluid
Driven Shear, complete with Motor,
Starter, Shadow Line Lighting, Pressure Gauge,
Surge Tank with Reducing and Relief Valve and New Knodes 10ft. × 1/1n. Fluid Driven Shear, complete with Motor, Starter, Shadow Line Lighting, Pressure Gauge, Surge Tank with Reducing and Relief Valve and Stop Cock, Remote Cable Control. Delivery ex-stock.

Further details from:—
C. & G. OLDFIELD, LTD.,
15, Abercorn Street,
PAISLEY.

Le Blond Regal Lathe, Allgeared 19in. × 48in., mot. switchgear, scutting gearbox, equipment. Ex. Cond.—THOMAS, LTD., Stirling Road, Solibull. 3075-6.

New-U.2 Victoria Universal Milling Machine, table 45in, ×11in. Power feeds in all directions. Immediate delivery. —BOX C795, MACHINERY, Clifton House, Euston Road, N.W.I.

Lang Heavy Duty Boring and
Facing Lathe, 14in. wing × 54in. between
centres. Speed 19 to 900 r.p.m. Feeds 36 to
432 c.p.l. Hole in spindle 14in. dis. #200 et
works. O.N.O. London area.—BOX C575,
MACHINERY, Clifton House, Euston Road,
N.W.I.

FORREST

BENNIE 4ft. × in. Bending Rolls. SWIFT Lathe, 15in. × 22ft. 6in. BROADBENT Lathe, 121in. × 6ft. 6in. HARVEY Lathe, 20in. × 9ft. 6in. RHODES 6ft. × in. Guillotine. FACEPLATE LATHE, 80in, swing. RICHARDS No. I and 4 Horiz. Borers. RICHARDS 5ft. Double Column Vert.

W. FORREST & CO. LTD., SYLVESTER GARDENS, SHEFFIELD. I

'Phone: 23314/5.



IDGEN BROS. L HELMET ROW, OLD STREET, LONDON, E.C.I

Telephone: CLErkenwell 6481



ALL MACHINES MOTORISED FOR 3 PHASE SUPPLY UNLESS OTHERWISE STATED

BORERS (Horizontal) KEARNS No. 2. BROACHING AMERICAN Model H2, stroke 30in. CAPSTANS HERBERT 25. MURAD \$in. and Iin. HERBERT 48.

MRILLS

MERBERT " C " Power Feed.

CORONA No. 21 AR, No. 3 M.T.

JONES & SHIPMAN 816, ½in. cap.

CORONA 1AX, No. 1 Morse Taper.

CORONA 15HF, ½in. cap.

PEGARD 3K. 6in. Radia,

LELAND GIFFORD 2-sp., No. 2 M.T.

HERBERT Type B. Single Spindle, ½in.

CORONA 6HX Cluster Type.

HERBERT Type H, žin. cap.

CORONA 12AX, ½in. cap. DRILLS

ENGRAYERS
LIENHARD 3 Dimensional (New).
LIENHARD No. IH.
HUPFIELD Router.
T.T. & H. Type C., C.B. and M.A.
T.T. & H Multi Etcher.

FILING AND SAWING MACHINES
WICKSTEAD No. 1 Hacksaw. RAPIDOR 6in. Hacksaw. RAPIDOR Filing.

FOLDERS Sheet Edging, 30in, × 22g.

GEAR CUTTERS
SAFAG Pinion.
MAXICUT 7in. × 2in. × 6 D.P.
PETERMAN No. 1 and 2.

GRINDERS (Surface)
JONES & SHIPMAN 540 Hyd.
SUPERIOR 13 × 5.
HEALD 25in. Ring.
CHURCHILL OSB 8in. × 30in. EXCEL No. 2, 14 × 6 hand. LUMSDEN Vert. 210 XXM. SNOW Table, 20in.
ABRASIVE No. 34 Vertical Spindle.
ABRASIVE 3B, 24in. × 8in.
ABRASIVE No. 1‡in. hand.

GRINDERS (Internal) BRYANT 16138 and 5.

GRINDERS (Cylindrical)
CHURCHILL 6 × 36in. B.Y.
CHURCHILL PBH 12 × 36in. Uni.
NEWALL 6 × 18. Model XL.
FRANCIS 6 × 7
PRECIMAX MPB 10 × 48.

GRINDERS (Miscellaneous) J. & S. Drill, ‡ to ∮in.
STEDALL WUNDERLI Carbide.
TAUCO I0in. Abrasive Cut Off.
ROWLAND I2in. × 2in. Single Wheel.
ABWOOD Carbide.
WICKMAN NIVEN Carbide. WICKMAN NIVEN Carbide.
WADKIN Saw Sharpener.
TURNER T. & C.
JACKMAN DIE 18in, Disc.
EXCEL Model OS. T. & C.
TURNER 14/20 20in. X-3ţin wheels C/E.
MATRIX No. 10 8in. x-20in. Plain Thread.
NEWALL 420 Univ. Threads for taps.
HUNT No. 0 and 1 Tap Regrinders.
HUNT No. 0 and 2 Drill.
CHURCHILL Valve.

GUILLOTINES EDWARDS 4ft. × 14 gauge Undercrank.

HONER
DELAPENA 4 speed. **KEYSEATERS**

BENTLEY Sin.
ASQUITH H.K.O. Horiz. Duplex.
EDGWICK 4in.

ATHES ATHES
MITCHELL 8‡in. × 5ft. S.S. & S.C.
LE BLOND Production.
RIVET S.S. & S.C. 4in. Model 602.
SOUTHBEND 10in. Toolroom.
WILLSON 7‡in. S.S. & S.C.
COLCHESTER TRIUMPH 7in. S.S. & S.C.
SWIFT 12 SV5 facing and boring, 48in.
MONARCH 10EE × 22in. S.S. & S.C.
SMALPIECE 9SW Multi-tool.
LORCH ALL Precision. SMALLPIECE YOW Multi-tool. LORCH All Precision. RIVETT 3½in. Plain. Model 715. WARD, HAGGAS & SMITH 8½in. × 78in. COULTHURST Surfacing and Boring. RYDERMATIC No. 12 Multi Tool. BERRY 6½in. S.S. & S.C.

MARKING MACHINE FUNDITOR "Sand Jet."

MILLERS (Horizontal)
CINCINNATI [118 Production.
DENBIGH Type C4. Table 46 × 10.
ROSCHER EICHLER. Table 39in. × 12in.
SUNDSTRAND No. 0 Production.
ST. ANDREA Model UFO3. Table 57 × 14.
KENT OWEN 1/8 and 1/1/4 Production.
HARDINGE Precision. Table 25 × 64.
WERNER. Table 14 × 5.
JONES 225 Univ. Table 22 × 6.
ARCHDALE 28in. and 20in.
RICHMOND O3. Table 40 × 10.
U.S. Multi Mill. Production.
PARKSON 2T Universal. Table 49 × 10.
MILLERS (Vertical)

MILLERS (Vertical)
C.V.A. 79 Tool and Die.
PALLAS VI. Table 30 × 84.
REED PRENTICE No. 5, 68in. × 16in. table. MILNE. Table 30in. × 8in. WADKIN Type LXIA. Table 36in. × 13in. MILNE

PRESSES (Power)
LECRA No. 8. 4 tons.
GERMAN Rotary Punch.
WRIGHT Clicking Press.
SCHULER VZZ. 15 tons d/s gripper feed.

PROFILING MACHINE
CURDNUBE 2 Spindle. Model KIV.

RIVETERS
HIGH SPEED Hammer, 7/16 cap.
TURNER RHIB (§in.), RH38 (§in.), RH34
(§in.), RH14 and 14/12 (§in.), RS6 (§in.).
SCREWING MACHINE
ATLAS No. 2, 3in.-6in. (Unused).

SHAPERS
ALBA 14in.
INVICTA 24in. and 14in.
NEWEY 14in.

SLOTTERS EDGWICK

EDGWICK.
BENTLEY 4in.
TAPPERS
ESSEX No. 24, ‡in. cap.
THIEL No. 4, ‡9/32nds.
ACE Horiz., ‡in. capacity.
HASKINS Type 3 C.A.M., ‡in. cap.
1 & S. Electrotan. & J. & S. Electrotap, Jin. THREAD MILLERS

JONES FB1, 4ft. between centres. WICKMAN MOULTON.

Herbert No. 4BS Capstan Lathe.

Further details from:—
C. & G. OLDFIELD, Lard.,
15, Aberoam Street,
PAINLEY.

20in. ARCHDALE PLAIN MILLING MACHINES

Power feeds and rapids to the table in all directions. 12 spindle speeds 60-1,230 r.p.m. Table size 40in. × 12in. 12 rates of feed 0.46-14.5. Two motors 400/8/50.

DIMCO (GT. BRITAIN) LTD., 28 Wood Lane Shepherds Bush

London, W.19. Tel.: SHE. 4401/2

No. 28V Herbert Kneeless Type No. 26V retroat Milling Machine. Table 35in. × 19in. Long. traverse 62in.; cross 38in.; 16 speeds 12-360 r.p.m. 20 h.p., 400/3/50 motor.—LEE & HUNT. L7D., Crocus Street, Mottingham. Tel.: 84246.

NEW MACHINE TOOLS FROM STOCK

GRANOR OF HALIPAX 28in, stroke Heavy Duty Shaping Machine, 400-440/3/50.

EARLY DELIVERY

MARLY DELIVERY

MITCHELL OF KEIGHLEY 84 in. Type
DMS Gap Bed Lathe, by 8ft, 8in. B.C.
400-440/8/50. Instant delivery.
MITCHELL OF KEIGHLEY 104 in. Type
DM10 Gap Bed Lathe by 5ft, 5in. between
centres. 400-440/8/50. Instant delivery.
MITCHELL OF KEIGHLEY 124 in. Type
DM12 Gap Bed Lathe by 6ft, 9in. B.C.
400-440/8/50. April delivery.
VIOTORIA No. 2 Rapidmil Universal Milling
Machine, table size 48in. × 114 in.
400-440/8/50. Instant delivery.
VIOTORIA No. V2 Vertical Milling Machine.
Table size 48in. × 11in. 400-440/8/50.
Instant delivery.

CENTAUR TOOL WORKS, EYRE STREET, SPRING HILL, BIRMINGHAM, IS

el.: EDGbasto 1118 & 1119. 'Grams: Capetan, Birmingham

Rockford 28in. Hydraulic Shaper for sale.—Apply BOX C777, MACHINERY, Clifton House, Euston Road, N.W.1.

Brown & Sharpe OOG Automatic for sale, series 14,400.—BOX C782, MACHINERY, Clifton House, Euston Road, N.W.1.

Conomatics. 4-spindle. 14in. Conomatics. 4-spindle.
14in. Conomatics. 4-spindle.
Wartime Machines.—BOX C790, Machinery
Clifton House, Euston Road, N.W.1.

A. R. Wade Electric Kiln, 80 kW, 3 phase, 440 volts, 50 cycles. Complete with thermostats and pyrometer control panel. 200 amp. T/P and N switch fuse. T/Pole contactor. Pyro table. 0.03/single 120ft. 4ft.

Work tray size 10ft. 2in. × 5ft. 3in. In excellent condition, has been used for glass fring in sign industry.—View by appointment with GENERAL or WORKS Manager. Water-loo 4565.

Api

K

A

K

24

6f

66 10

Al CC OC Di GI

B W KI BI

ALBERT EDWARDS

(MACHINERY) LTD., 79/89, PENTONVILLE ROAD, LONDON, N.1.

Telephone: TERminus 0167/8/9.

Telephone: TERMINUS 0167/8/9.
CINGINART 3 × 36 Duplex Hydromatic Mill.
ABGEDALE 36in. Production Drill No. 5 M.T.
FORTER-REPIERTZ 130 ton Inclinable Power
Press. \$in.5-in. adjustable stroke. Geared.
M/D 400/350.

TATIOR & CHALLEN 370, 20 ton Power Press.
4in. stroke. Geared. M/D 400/350.

REDIBUSER 6in. Bevel Gear Shaping Machine.
M/D 400/350.

SONDERMAN & STEER 40in. table Vertical
Boring Machine. Swing 42in. Table speeds
to 135 r.p.m. M/D 400/8/50.

Bryant No. 24-36 Hydraulic Internal Grinder complete with Hydraulic Wheel Dressing device, Spindle, etc.

Further details from:—
C. & G. OLDFIELD, Ltd
15, Abercorn Street,
PAISLEY.

Reed Prentice No. 5 Vertical
Milling Machine, Table 68in. × 16in.
18 Spindle Speeds 17-600 r.p.m. Excellent
condition.—Further details from:—

C. & G. OLDFIELD, LTD., 15. Abercorn Street, PAISLEY.

Acme-Gridley Jin., 4 Spindle automatic screw machines. Models R and G. 400/3/50.—HICKS MACHINERY, LTD., 26, Addison Place, London, W.11. Tel.: PARk

Worthington Simpson 2-stage
Air Compressor. Air cooled, size 100.
Brooks Motor 21 h.p. 400-440/8/50. Syn. speed
1,000 r.p.m. and Receiver.—BOX. CSSR.
MACHINERY, Clifton House, Euston Road,
N.W.1.

1.000 Ton 'Eumuco' Knuckle Joint Coining and Sizing Press, steel plate construction, 2in. stroke, 31in. between sides with 40 h.p. motor drive.

REED BROTHERS (ENGINEERING) LTD., Replant Works, Woolwich Industrial Estate, London, S.E.18. Tel.: Woolwich 7611 (8 lines).

KENDALL & GENT Plano Milling Machine. 10ft. × 4ft. × 3ft.

LIBBY IH5 Turret Lathe. 5in. hollow

BUTTERFIELD Face Plate Lathe. 10ft. 6in-swing × 8ft./10ft. dia. Face Plate.

NORMAN E. POTTS (MACHINERY)

151/154 Sandy Lane, Birmingham 12. Tel.: VIC 1278.

Automatic. Peterman 7 mm. Activation and the control of the co

36in. Lang All-geared S.S. & S.C. Chucking Lathe with taper turning attachment. 30in. four-law chuck. 36in. between chuck and saddle. 20 h.p., 400/8/50 motor. 12 speeds 8.5-403 r.p.m. Spindle bored 2½in. dia. Timken roller bearings.—LEE & HUNT, LTD., Croous Street, Nottingham. Phone: 84246.

Machinery's SMALL advertisements bring BIG results

FOR RATES SEE COMMENCEMENT OF CLASSIFIED AD. SECTION INSTRUCTIONS CAN BE ACCEPTED, SPACE PERMITTING, AT THE LONDON OFFICE UP TO WEDNESDAY NIGHT FOR PUBLICATION ON THE FOLLOWING WEDNESDAY.

		1		-		
			-			
				-		
			1			
1 11						
	1			1		
				-		
						1
1 .						
				100		
**						-
				17-3-1	11 11	
		House Enston Ro	ad, London, N.W.1		Phone	EUSton 8441
CHINE	(KY." Clifton					
ACHINE	sky," Clifton		, 2011011, 11.11		2 100100	DO OTON OAAT
			We enclose remittance			
are authori						
u are authori						
are authori ME						
are authori ME						
are authori ME						

CONOMATIC 11 in. 8 spindle. Type W W.

BORING KEARNS No. 2 Boring and Facing. DRILLING
ASQUITH 4ft. 6in. O.D.1 Radial Drill.
PROGRESS 5E. Round table.

GEAR SHAPING

Model 61 FELLOWS Gear Shaper, 1942.
Straight spur, 35in. dia. × 5in. face width.

MONARCH 22M S.S. & Taper Turning Lathe.
WARD 10ft. Combination Turret Lathe.
WARNER & SWASEY No. 2A Long. bed.
SOUTHBEND 16in.
EDGWICK 7in.
DEAN, SMUTH & GRACE. Height of

centres 7in. WARNER & SWASEY No. 5 Preselector.

MILLING
KENDALL & GENT C.V.M. 40. In good condition.

20in. ARCHDALE Plain Mill. Rapid.

18in. EDGWICK Production Mill.

MILWAUKEE 2E Plain.

24in. CHURCHILL REDMAN Heavy Duty. 19in. TOWN Heavy Duty.

GUILLOTINES.

EDWARDS 6ft. × ¼ in. Overcrank.

FOLDERS.

FOLDERS.
MORGAN 6ft. × 14g. Universal.
EDWARDS 6ft. × in. Swing beam, hand

geared. EDWARDS 6ft. \times 14g. Open ended. EDWARDS 6ft \times 16g Open ended.

"ELDAIR" NEW PRESS BRAKES

. × 12g. between columns. Delivery 6ff. × 12g. Detween Column. Delivery 3 weeks.

10 weeks.

10 teck.

10 teck.

10 teck.

10 teck.

10 teck.

10 teck.

All machines motorised 400/3/50 cycles.

STANCROFT LTD. BEDWORTH ROAD, COVENTRY.

Telephone: Coventry 88072/8.

PLAIN CYLINDRICAL GRINDERS for prompt delivery

Canacity :-

24in. by 197in. Schmaltz "R6." 24in. by 180in. Churchill Model "F" 18in, by 72in. Landis Type "C" 6in. by 34in. Churchill "AY"

Full details from:

SOAG MACHINE TOOLS, LTD.

7, Juxon Street, Lambeth, London, S.E.11.

'Phone : RELiance 7201

'Grams: Sotoolsag, London, S.E.11.

FOR SALE

VICTORIA Model U.3 Universal Miller; table 60in. by 121in.; 12 spindle speeds 20-1,020 r.p.m.; rapid traverses in all directions; complete with vertical milling attachment and slotting attachment; 400/3/50 motor drive.

Excellent condition.

L. E. H. COOK LTD., Mountgrove Road, London N.5 Canenbury 7806/7 and 4943.

New & Used Machine Tools

HERBERT No. 5 Chucking Automatic.
RAGLAN 5in. Centre Lathe, arranged with Capstan turret and collet equip.
Cond. as new. Cond. as new.

DEAN, SMITH & GRACE 13Z Toolroom

Centre Lathe.

CHURCHILL-REDMAN 22in. swing × 5ft. bet. str. bed. Prod. Lathe.

RICHARDS Hori. Boring and Facing Machine, 32in. facing head with extensions to face about 5ft. dia. 17ft. bed.

CHURCHILL Ioin. × 20in. Hyd. Plain Cylindrical Grinder.

CHURCHILL No. 1 Planetary Internal Grinder.

Grinder.
New RATZER 12 ton Inclinable Ungeared

Power Press. Adj. stroke.

RHODES 5ft. × in. Overcrank Guillo-

tine.
VICTORIA M.2 Universal Mill.
CINCINNATI Model 3-24 Hydromatic
Hori. Production Mill.
WILKINSON 9in. Slotter.

There are many more at

STRAIGHT & VINES LTD., MINT STREET, BOROUGH,

LONDON, S.E.I

Telephone: HOP 4364

HIGH QUALITY USED MACHINE TOOLS

MACHINE TOOLS

ABGHDALE 20tm. Milling Machine, table aise 40in. x 10im., power and rapid traversee to table, reversing spindle, backissh eliminator. 400/3/50.

COVARO 18tm. Swing Gap Bed Lathe, by 2ft. 3im. bo. 400/3/50.

COVARO 18tm. Swing Gap Bed Lathe, by 2ft. 3im. bo. 400/3/50.

CHANOR OF HALIPAX 18tm. x 25ft. bo. A.G.H. Gap Bed Lathe by 2ft. 3im. bo. A.G.H. Gap Bed S.S. & S.C. Lathe. 400/3/50.

D.S. & G. 7im. CH by 4ft. 0im. b.c. Straight Bed Lathe. 400/3/50.

BARDONS & CLIVER NO. 3 Universal Turret Lathe. 400/3/50.

WARNEE & SWAEEY 1A Turret Lathe. 400/3/50.

WARREN & SWARRY IA Turret Lathe,
400/3/50.
EELLY 28in. Stroke Heavy Duty Shaping
Machine with swivelling table. 400/8/50.
EUSSELL Saw Sharpening Machine, max.
capacity 22in. diameter. 400/8/50.
CHARROD 12in. Slotting Machine.
400/8/50.

WE UNDERTAKE REBUILDING OF ALL TYPES OF MACHINE TOOLS

CENTAUR TOOL WORKS, EYRE STREET, SPRING HILL, BIRMINGHAM, IS

Tel. EDGbaseon 1118 & 1119 'Grams Capsian, Birmingha

11in. Centre Churchill-Redman
Model 11NM M/d all-geared hollow
spindlet 3Hin.) S.S. & S.C. Lathe with taper
turning attachment, on 15Rt. 3In. gap bed.
Admits 8H. 6in. b.c. and 38in. dia. in gap,
16 speeds 14-406 r.p.m. Norton type gearbox.—
LEE & HUNY, LTD., Crocus Street, Nottlingham.
Tel.: 34246



Selbourne Road Tel. 52351

New Machines From Stock

EXCEL No. 1 Surface Grinder. QUALTERS AND SMITH 6in. Hacksaw. VICTORIA 02 Omnimil. CARDIFF 7½in. by 40in. Lathe. SMART AND BROWN 1024 S.S./S.C.

RICHMOND SR.2 48in. Radial Drill. DENBIGH D4 Miller. VICTORIA U2 Universal Mill.

MYFORD MG.12 Cylindrical Grinder.
VICTORIA V2 Vertical Mill.
MITCHELL DM.8 Lathe.
SMART AND BROWN H3 and H5
Toggle Presses.
MYFORD ML.7 Lathe.
PROGRESS 1, 2 and 3 Mills.
INVICTA 4M Shaper.
NORTON AND DENBIGH Fly

Api

MISCELLANEOUS FOR SALE

Masson Seeley Engraving and where the part of the control of the

Pive in Number Horstmana
Callper Type Thread Gauges in brand
new condition (hardly used). Five sizes:
2BA, 4in., 4in., 4in. and 4in. Bs.F., all set
with 0.0007in. cadmium plating allowance.
£25 the lot.—Write BOX C781. MACHNERY,
Clifton House, Euston Road, N.W.1.

Climax Forklift Coventry Trucks!!! A choice selection of Petrol and Diesel models. From 1,500 lbs, to 4,000 lbs. capacity. 9ft. to 14ft. lifts.—Full details and prices from SPEED ELECTRICS, Dept. M. Church Street, BasGord, Nottingham. Tel.:

AUCTIONS

By Order of the Receiver, E. HATTON MILLER, F.A.C.C.A.

Re: Crawley Metal Productions Limited.
ANGMERING-ON-SEA,
SUSSEX

HENRY BUTCHER & CO.,

are instructed to offer for SALE BY AUCTION in LOTS at THE CONSERVATIVE HALL, SEA ROAD, EAST PRESTON on

WEDNESDAY, 26th APRIL, 1961, at 10.30 A.M., the

PLANT, MACHINERY, STORES AND EQUIPMENT

including

"NEW BRITAIN" No. 00 6 SPINDLE AUTOMATICS

S.S. & S.C. CAPSTAN and TURRET LATHES by "Herbert," "Colchester," "Glabolt," "Le Blond" and "Ward"

"B.S.A." and "HERBERT" CHUCKING AUTOMATICS

S.S. & S.C. CAPSTAN and TURRET LATHES by "Herbert," "Colchester," "Glabolt," "Le Blond" and "Ward"

"B.S.A." and "HERBERT" CHUCKING AUTOMATICS

WENTING AND HERBERT "CHUCKING AUTOMATICS

HEINEMAN" R.S.50 COPYING LATHES VERTICAL and HORIZONTAL MILLING by "Archdale," "Cincinnate" "Denbigh" and "Victoria" "Denbigh" and "Victoria" "Denbigh" and "Victoria" "Denbigh" and "SERTINEL "CRIDAN, B. AUTO SCREW MACHINES

By "Archdale," "COCODA" and "Herbert" CYLINDRICAL, SURFACING and UNIVER-SAL GRINDERS

by "ARchdale," "COCODA" and "Herbert" CYLINDRICAL, SURFACING and "Herbert" CYLINDRICAL, SURFACING and UNIVER-SAL GRINDERS

by "ARCHDALS" "ADWOOD," "CHURCHII" and "KEARNS" "ADWOOD," "CHURCHII" and TAPPING MACHINES

POWER PRESSES UP TO 20 TONS

SHAPING, SLOTTING, KEYERATING and TAPPING MACHINES

POWER PRESSES UP TO 20 TONS

SHAPING, SLOTTING, KEYERATING and TAPPING MACHINES

POWER PRESSES UP TO 20 TONS

SHAPING, SLOTTING, KEYERATING and TEST. D. FOLISHER. SCREW Fly Presses

"MANLOVE" 48In. SEPARATOR. AIR COMPRESSORS

ENGINEERS SMALL TOOLS and TEST. SPRAY and SEQUIPMENT

Spray and SEQUIPMENT

Spray and SEQUIPMENT

Spray and SEQUIPMENT

Senches, Storage Racks and Bins, Fluorescent Light Pittings. Motor Van

Catalogues (when ready) may be obtained of Messes, HENRY BUTCHER & CO., Auctioneers, Valuers and Sucutioneers.

Catalogues (when ready) may be obtained of: Messrs. HENRY BUTCHER & CO., Auctioneers, Valuers and Surveyors of Factories, Plant and Equipment, 78 Chancery Lane, London, W.C.2.

Telephone: HOLborn 8411 (8 lines).

SITUATIONS VACANT

If you do not wish your reply to any Bow No. advertisement in this section to be forwarded to cortain Arms, please advise us. Your reply will then be destroyed, but you will not be notified as this would disclose the identity of the advertiser.

Draughtsman detail work in connection with special purpose machine design. Good mechanical experience necessary.—DATIM MACHINE TOOL CO., LTD., Brooker Road, Waltham Abbey.

W. E. SYKES LIMITED

MANOR WORKS, (Off Kingston Road) STAINES

Telephone: STAINES 51313

An expanding Machine Tool programme enables us to invite applications for the following posts:—

ELECTRONIC DESIGNER

Required for design and development work on Electronic test gear, machine tool control gear and electro-mechanical devices.

ELECTRICAL DRAUGHTSMAN

To work on machine tool control gear and electromechanical assemblies.

ELECTRONIC TECHNICIAN

To construct, test and assist in the development of electronic control, measuring and recording equipment, test gear and electro-mechanical devices. Knowledge of basic circuit theory and practical ability essential.

DESIGNER/DRAUGHTSMAN

For gear tooling design work involving the use of mathematics to O.N.C. standard and large scale geometrical drawing.

These are permanent posts offering excellent conditions of service, generous salaries and good prospects. Please apply in writing to Personnel Officer.

CHAMBERLAIN INDUSTRIES LIMITED

have vacancies on a new Permanent Night Shift for the following Tradesmen:-

- CENTRE LATHE TURNERS
- HORIZONTAL BORER
- VERTICAL BORER
- . RADIAL DRILLER

Four shifts will be worked each week, Monday to Thursday, 101 hours each shift.

For further details please apply Personnel Officer, Argall Avenue, Leyton, E.10, or Telephone Mr. Howell, LEY.3678.

Executive Selection Division

is advising on the following appointment

WORK STUDY & PLANNING ENGINEERS

Vacancies exist for three Work Study and Planning Engineers in a rapidly developing engineering company with two works in attractive surroundings within twenty miles radius of Leeds. Practical knowledge of machine shop work or light structural engineering and metal work is desirable, and experience in work planning will be an advantage. Training in Work Study will be given by consultants. A good starting salary will be offered and, in this progressive organisation, there is ample scope for men of initiative and ability to develop their opportunities. Applicants, who should be between 23 and 35 years of age should send full information of their qualifications and experience to

Mr. N. D. Carter, Associated Industrial Consultants Limited

15 RAILWAY STREET, HUDDERSFIELD, YORKS.,

All applications will be treated in complete confidence.

Associated Industrial Consultants

A SENIOR PRODUCTION ENGINEER

is required by

is required by
W. H. ALLEN SONS & CO. LTD.
A vacancy exists for a Senior Production
Engineer capable of originating and
developing improved manufacturing
techniques over a wide range of products
on a one-off and small bactch basis.
Applicants must have had considerable
experience in the manufacture of one
or more of the following:—

STEAM TURBINES
DIESEL ENGINES
ELECTRICAL MACHINERY
The post carries high responsibility and
offers good prospects for further advancement. Conditions include a contributory
Pension Scheme with free Life Assurance
and a comprehensive range of welfare
and recreational amenities. Where
appropriate, financial assistance towards
the expenses involved in moving to the
Bedford area will be given to the successful
applicant.
Salary according to
qualifications and experience.
Apply in writing, giving details of
experience, qualifications, age and present
salary to:

salary to: THE PERSONNEL MANAGER
(Ref. 1408E/3)
QUEENS ENGINEERING WORKS
BEDFORD

Highly Paid, Secure and Interest-Highly Paid, Secure and Interesting posts are always available for technically trained men. Find out how you can put some letters after your name by preparing at home on "No Pass—No Fee" terms. A.M.I. Mech. E., A.M.Prod. E., A.M.S. E., City and Guilds, etc. Full details of exams, and hundreds of courses in all branches of Engineering, Draughtmanship, Management and Automation Techniques, the benefits of our Employment Dept., and unique record of 50 per cent. successes are given in "Engineering Opportunities"—a valuable 148-page Guide which will reveal many chances you are now missing.—Wite for your copy today (stating subject of interest).—FEEE and without obligation, B.I.E.T. (Dept. 43s), 29, Wright's Lane, London, W.S.

Technical Sales Manager for Midlands area required by Machine Tool Company having branch office and showrooms. Experience in similar position preferred.—Send details in confidence to PERSONNEL MANAGER, BOX C839, MACHINERY, Clifton House, Euston Road, N.W.1.



have been retained to advise on the appointment of

WORKS MANAGER Precision Engineering

for a Midland company employing about 400 and specialising in high grade machining for the motor, aircraft and allied industries. The Works Manager will be expected to contribute to, and participate in, expansion plans. There would be no bar to an eventual directorship. Starting salary around £1,750. Contributory pension scheme.

Candidates around 35 to 40 must be mechanical engineers, expert in precision machining work and with experience of managing a machine shop. Please send brief details in confidence quoting reference PP.3223 to H. C. S. Brand.

MANAGEMENT SELECTION LIMITED 17 Stratton Street, London, W.1.

In no circumstances will a candidate's identity be disclosed to our client unless he gives permission after a confidential interview at which he will be given full details of the appointment.

BUCKINGHAMSHIRE EDUCATION COMMITTEE SLOUGH COLLEGE OF FURTHER EDUCATION

Principal: R. EDGAR, M.Sc., M.A. DEPARTMENT OF ENGINEERING

The Following Post is Available

ASSISTANT GRADE B FOR WORKSHOP SUBJECTS

The post entails teaching Workshop Technology and Workshop Practice up to final level of the City and Guids Machine Shop Engineerina and Craft Practice courses. Qualifications will be judged on their merits and candidates must have good industrial experience. Some teaching experience or teacher training will be helpful.

Salary in accordance with the Burnham Further Education - Report, viz.: \$700 to £1,150 per amum. Additions are payable for graduate qualifications and for recognised training and the starting salary will depend upon previous industrial and teaching experience of the applicant.

Further particulars may be obtained from the PRINCIPAL, The College of Further Education, William Street, Slough, and forms should be returned within 14 days.

Machine Tool Maker situated at Sheemess requires Technical Sales Correspondent to deal with enquiries, etc. Knowledge of Machine Tool Technicalities essential.—BOX C791, MACHINESY, Clifton House, Euston Road, N.W.1.

Kent Alloys, Ltd., of Temple
Manor Works, Strood, Kent, require a
fully experienced Planning, Estimating, and
Bate Fixing Engineer. Four-figure salary for
fifth man. Contributory Pension Scheme and
Employees Shareholding Scheme operated
Travelling expenses paid if selected for inter,
view.—Apply, giving full details of age
experience, etc., to PERSONNEL MANAGER.

Toperating with Cond Machanical.

Foreman with Good Mechanical engineering background, required by company manufacturing printed circuits in Tolworth area. Experience of setting and working to close limits essential. Superannustion scheme.—Write giving full details of experience, age and salary required to BOX PW5085. A.K. ADVG. LTD., 2128, Shaftesbury Avenue, London, W.C.2.

REPRESENTATIVE

ESTABLISHED FIRM OF
TUNGSTEN CARBIDE
TOOLMAKERS

Have Vacancy for a

TEGHNICAL
REPRESENTATIVE
IN THE
LONDON AREA

GOOD WORKING KNOW-LEDGE OF, & CONTACT WITH, THE ENGINEERING INDUSTRY IN, THE AREA ESSENTIAL.

Apply BOX No. C789, MACHINERY, Clifton House, Euston Road, N.W.I

Machine Tool Maker Situated in Sheerness requires Technical Sales Representatives. Salary, Expenses and Commission. As the remuneration is extremely generous, only applicants with a proved record of success will be considered.—BOX C 798, MACRINERAY. CHIROL HOUSE, EASION ROAD, N. M.

Agent, London Area, for Grey Iron, aluminium and non-ferrous castings and diecastings, machining and fabrications in steel. Midland Foundry requires the services of a well connected person or firm to represent them on an Agency basis.—BOX C801, MACHINERY, Clifton House, Euston Road, N.W.I.

TECHNICAL SALES REPRESENTATIVE

Leading Ground Thread Tap and Die Manufacturer invites applications for above for the London Area. The position calls for man age 30-35 with good connections among the large users in this area. This is a responsible position and terms will be commensurate to the situation. All replies in strict confidence to:—

BOX C.792, MACHINERY, Clifton House, Euston Road, N.W.I

SITUATIONS WANTED

Manager, Fully Experienced All depts. of Toolmaking, Production and Prototype light precision engineering. A.I.D., etc., accustomed modern management techniques, full control. Desires change, any area. Age 40.—BOX C759, MACHINERY, Clifton House, Euston Road, N.W.I.

Engineer Requires Responsible position. Age 34, indentured apprentice. Full C and G Cert. Experience Jig and Tool design, process planning, estimating, methods, buying, present location S. Esst England. Propared to travel.—BOX C787, Machinery, Cliffon House, Euston Road, N.W.1.

Chief Draughtsman. Jigs and Tools 16 years. Specialised measuring equipment 3 years. Planning, ratefixing, etc. Electro-Mechanical and pneumatic equipment. Good orsaniser. Age 46, any offers considered.—BOX CS00, MACRINERY, Clifton House, Euston Road, N.W.1.

RECEIVED TOO LATE FOR CLASSIFICATION

•WORK TO PLACE•

Large Company Making Special machinery seeks capacity for complete manufacture and building of their machines.—Please write in the first place with full details of company, list of plant, and giving details of normal business, to BOX C796, MACHINERY, Clifton House, Euston Road, N.W.1.

MATERIALS FOR SALE

Surplus Brass Stocks BSS 249, 7,000ft., .710 across the flats hexagon 4,000ft. idn. across the flats hexagon and 380ft 2ln. dia.—Offers to HERBERT GRANGE & CO., Norgren Works, Shipston-on-Stour, Warwicks.

CONSULTANTS

TECHNICAL SERVICE FOR SMALL ENGINEERING COYS.

Process Planning, Jig and Tool
Design, Advice on Production Methods.
Component Drawings, etc.

The collective Brains and Ideas of a Team of experts at your service. BOX C302, MACHINERY, Clifton House, Euston Road, N.W.1.

PLANT WANTED

Modern Good Class Machine Tools and Sheet Metal Machinery required for prompt cash.—H. BELL (MACHINE TOOLS) LTD., Walter Street, Leeds, 4. Tel: 63-7398.

Societe Genevoise Used No. 3K or No. 4G Jig Borer. Hauser or similar considered.—Details to BOX C633, MACHINEBY, Clifton House, Euston Boad, N.W.1.

WANTED

WEBSTER & BENNETT or BULLARD 24in. Vertical Borers. Two HERBERT No. 4 Senior Capstan Lathes.

Single-ended Fine Borer for 8in. bores. Three 4-Spindle Drills with power feed to all spindles. CUNLIFFE & GROOM Horizontal Milling Machines.

BOX C.803, MACHINERY, Clifton House, Euston Road, N.W.I.

Urgently Required, E.M.B. No. 12 cold chamber discasting machines.—BURDON & MILES LTD., Delamare Road, Cheshunt, Herts. Telephone: Waltham Cross 24352.

Wanted, Small Precision Cylindrical grinding machine for toolroom work. New or secondhand. Jones & Shipman 520A or similar machine.—STEEL-CRAFT JIG & TOOL CO., Horton Bridge Road, West Drayton. Telephone: West Drayton 2580.

Aby Ack Ada Ada Airc Alle Ami And Ang Arc Arc Asq Assc Atki

Bal Bedi Bell Bend B.G. Brac Brac Brill

Briti Briti Briti

Briti Bros Broo Broo

Break Bed Lathe to Swing 14ft.
diameter and admit 23ft. 6in. between
centres. Swing of 14ft. required throughout
the distance admitted between centres. Age
immaterial.—Details to BOX C797, MACHINERY,
Clifton House, Euston Road, N.W.I.

BUSINESS FOR SALE

Small Engineering Business For sale, due to ill health. Sole makers and patentees of the Uniform Traverse Grinding Machine, Patent No. 346563, together with Machine Tools, Patterns, Jigs. Small Tools, Property on Rental. Patentee would give every help and assistance for six months.—BOX C708, Macuinnery, Clifton House, Euston Road, N.W.1.

PRECISION TOOLS & GAUGES





LAPPING ... SCRAPING ... GRINDING... HONING... ENGRAVING...

MILLING ... SAWING.

BROOKS & WALKER LTD.,

Midland Office: Swan Lane, Coventry. Tel.: 28696





PLUG and RING GAUGES GAUGES NOW AVAILABLE CHROME-PLATED.

47 Great Eastern St., London, E.C.2. SHO 7633 Telex No. 23674

Branches throughout the Country



INDEX TO ADVERTISERS

A.B.M.T.M. Ltd 27 & 62	Brown & Ward (Tools
Abwood Machine Tools Ltd	B.S.A. TOOIS Ltd
Acbars Ltd 109 & 154	Buck & Hickman Ltd
Ackworthie John Ltd	Burnerd, F. & Co. Lte
Adams, Cyril & Co. Ltd	Burton, Griffiths & C
Adcock & Shipley Ltd 20	Bush, Beach & Segner
Aircraft Unit Eng'g, Co	Butcher, Henry & Co.
Allen, Edgar & Co. Ltd	Butterley Co. Ltd., T
Ambressey Engineering Co. Ltd 134	
A.M.T. (Birmingham) Ltd	
Anderton Springs Ltd	
Anderton Springs Ltd	Calver, C. M. G. Ltd.
Anglo Cam Designs	arron Co.
Archdale James & Co. Ltd	Carter, B. & F. & Co.
Armytage (Tools) Ltd	Cashmore, John Ltd.
Armytage (Tools) Ltd	Cattermole, H. S. &
Associated Electrical Industries Ltd 108	Centaur Tool Works
Atkin, W. T. (Tottenham) Ltd 92	Chater-Lea Mfg. Co. I
Aylesbury Turned Parts (True Screws) Ltd. 136	Chatwin, Thomas & C
Ayreabuty Intuct I area (Ituo botowa) Lied. 100	Churchill Machine Too
	Cinetra Manufacturin
	Clare Collets Ltd
	Cook, L. E. H. Ltd.
Balfour, Arthur & Co. Ltd. 5 Baynes, Charles Ltd. 138 Bedford, James & Co. (Halifax) Ltd. 106 Bed H. H. Machine, Tooks Ltd. 151 & 158	Cornercroft Ltd
Daynes, Charles Ltd 138	Coventry Grinders Lt
Bedford, James & Co. (Halifax) Ltd 106	Cross Manufacturing
Bell. H. (Machine Tools) Ltd 144, 151 & 158	Croydon Tool & Case
Benton Engineering Co. Ltd., The 134	Ltd
B.G. Machinery Ltd 94	SELECTION OF PERSONS
Bradley & Turton Ltd 118	The second second
Brasshouse, Peter Ltd	Control of the second
Reilhart Ltd. 139	Timeo (Gt. Britain)
British Aero Components Ltd. Inside Back Cover	Dimeo (Gt. Britain) insdale Engineering
British Laminated Brass Co. Ltd 126	Douglas, A., Co. Ltd.
British Ronceray Ltd 40	Dowding & Doll Ltd.
British Ronceray Ltd	Dowling, David Ltd.
Roller Rearing Co. "	Dronsfield Brothers I
Roller Bearing Co 8 & 9 British Wagon Co. Ltd., The	Drummond-Asquith I
Broadbent, Henry Ltd	Drummond Bros. Lte

ч	Brown & Ward (Tools) Ltd
я	B.S.A. Tools Ltd
	Buck & Hickman Ltd
9	
9	Burnerd, F. & Co. Ltd 60
ч	Burton, Griffiths & Co. Ltd Back Cover
	Bush, Beach & Segner Bayley Ltd 110
9	Butcher, Henry & Co 158
а	Butterley Co. Ltd., The 95
1	Malway C M C Ttd 79
H	Calver, C. M. G. Ltd. 78 Carron Co. 93 Carter, B. & F. & Co. Ltd. 139
	Carton D to 12 to Co Ttd
U	Cashmore, John Ltd.
	Centaur Tool Works 149, 155 & 157
1	Chater-Lea Mfg. Co. Ltd 136
	Chatwin, Thomas & Co
	Churchill Machine Tool Co. Ltd., The 62
	Cinetra Manufacturing Co. Ltd 133
	Clare Collets Ltd 105
	Cook, L. E. H. Ltd
	Cornercroft Ltd 96
3	Coventry Grinders Ltd. 134 Cross Manufacturing Co. (1938) Ltd 114
3	Cross Manufacturing Co. (1938) Ltd 114
3	Croydon Tool & Case Hardening Specialists
Ļ	Ltd
ï	
1	
2	CONTRACTOR OF STREET WAS A STREET OF STREET
•	Dimeo (Gt. Britain) Ltd 152 & 155 insdale Engineering Co. Ltd 131
p	Dinsdale Engineering Co. Ltd
ì	Douglas, A., Co. Ltd
í	Dowding & Doll Ltd. 28, 29 & 88
١,	Dowling, David Ltd
1	Drongfield Brothers Ltd 91
i	Drummond-Asquith Ltd. Inside Fron' Cover & 57
i	Drummond Bros. Ltd 57
í	Dunbar & Cook Ltd
í	Durable Tools Ltd
•	Duranto Louis Lieu.

PAGE	PAGE	PAGE
Abbey Heat Treatments Ltd.	Brown, David Corporation (Sales) Ltd., The Brown & Ward (Tools) Ltd.	Eclipse Foundry & Engineering Co. (Dudley) Ltd. 132 Economic Stampings Ltd. 137 Edmonton Tool & Eng's. Co. Ltd. 138 Edwards, Albert (Machinery) Ltd. 156 Edwards, F. J. Ltd. 141, 144, 148 & 151 Electro Mechanisms Ltd. 21 & 122 Electro Mechanisms Ltd. 21 & 122 Elliott, B. (Machinery) Ltd. 98 & 153 English Electric Co. Ltd., The 68 Eumuco (England) Ltd. 58
Archdale, James & Co. Ltd. 103 Armytage (Tools) Ltd. 101 Asquith, William, Ltd. Inside Front Cover Associated Electrical Industries Ltd. 108 Atkin, W. T. (Tottenham) Ltd. 92 Aylesbury Turned Parts (True Screws) Ltd. 136	Carter, B. & F. & Co. Ltd. 139 Cashmore, John Ltd. 146 Cattermole, H. S. & Co. (Hydraulics) Ltd. 75 Centaur Tool Works. 149, 155 & 157 Chater-Lea Mfg. Co. Ltd. 149, 155 & 157 Chater-Lea Mfg. Co. Ltd. 136 Chatwin, Thomas & Co. Ltd., The. 62 Cinetra Manufacturing Co. Ltd. 133 Clare Collets Ltd. 157 Cook, L. E. H. Ltd. 157	Prescol Ltd. 66
Palfour, Arthur & Co. Ltd.	Croses Manufacturing Co. (1988) Ltd	Granby, Paul & Co. Ltd. 176, 141 & 180 Granby, Paul & Co. Ltd. 76 & 77 Gray, R. O. 147 G.R.M. Heat Treatments Ltd. 134
British Aero Components Ltd. Inside Back Cover British Laminated Brass Co. Ltd. 126 British Ronceray Ltd. 126 British Timken: Division of the Timken Roller Bearing Co. 8 & 9 British Wagon Co. Ltd. The 24	Douglas, A., Co. Ltd	Hamilton, W. F. & Co. (Importers) Ltd. 100

(Continued on page 162)

INDEX TO ADVERTISERS—(continued from page 161)

PAGE	PAGE	PAGE
Heald Machines Ltd. 1	Meddlings, W. J. Ltd.	Salter, George & Co. Ltd. 30
Telear Hardening Co. Ltd.	Maish Bros. & Co. Ltd. 132 Welll, James & Co. (Sheffield) Ltd. 4 Newall Dued Machine Division 150 Newcombe & Hastings Ltd. 133 Newman Industries Ltd. 6, 142 450 Norman Electrical Co. Ltd. 114 Norton, T. & Co. Ltd. 86 Norton, W. E. (Machine Tools) Ltd. 142	Southern Forge Limited
Kavanagh O'Moore & Co. Ltd. 112 Kearns, H. W. & Co. Ltd. 68 Kelf, Alan Ltd. 138 K.E.N.T. Machinery & Engineering Co. 141 414 Kerry's (Engineering) Co. Ltd. 35 Kierserling, Th. & Albrecht 25 Kirk, Harry Eng's, Ltd. 153	O.K. Trading (B'ham Factors) Ltd. 140 Oidfield & Schoffield Co. Ltd. 37 Ormond Eng'g. Co. Ltd., The 17 Partington, Wm. Ltd. 144 ayne Products International Ltd. 49 Pidgen Bros. Ltd. 96 Pollard, Fredk. & Co. Ltd. 119 Powell, C. B. Ltd. 156 Powell, C. B. Ltd. 131 Powell, C. B. Ltd. 131	Stuart-Turner, S. M. & Co. (Surrey) Ltd. 134
Anden (Engineers) Ltd. 131	P.R. Motors Ltd. 92 Precision Gear Machines & Tools Ltd. 64 Precision Heating Ltd. 132 Precision Products (Romford) Ltd. 131 Precision Rubbers Ltd. 102 Presswork Products Ltd. 137 Price, J. T. & Co. Brass & Aluminium Founders Ltd. 61 Protolite Ltd. 69	Universal Ball Bearing Co
Lenchs (Birmingham) Ltd 138 Lethaby, Wm. & Co. Ltd. 120 Leytonstone Jig & Tool Co. Ltd. 124 Liberty Eng's, Supplies Ltd. 144 Liton's Machine Tool Co. Ltd. 149 London Pressed Hinge Co. Ltd. 120 London Shatting & Pulley Co. Ltd. The 23 23	Qualcut Tools Ltd. 13 qualters & Smith Bros. Ltd. 38 Raistrick, J. E. Ltd. 141 handslie (Luton) Ltd. 157	Van Moppes, S. J. Ltd. 127 Vaughan Associates Ltd. 70 Vaughan, Edgar & Co. Ltd. 22 Veraloy Products Ltd. 14 Visual Planning Systems Ltd. 110
MacDowall Equipment Ltd. 138	Name	Walkin Ltd.



FOR PRESS TOOLS, JIGS & FIXTURES
MOULDS & DIES, SPECIAL MACHINES, MULTI-DRILL HEADS, GAUGES, ETC
CONSULT THE TOOLING SPECIALISTS—

PETER BRASSHOUSE LTD

SPRING HILL . BIRMINGHAM . 18 . PHONE : EDG 2114-5



BRITISH
AERO
COMPONENTS
LIMITED
WARWICK



THE BUSH WITH HIME LIVES



supreme



Milling cutters, twist drills, reamers, taps and dies, dieheads, tapping attachments, screwed shank tools and chucks, thread rolling dies, drill chucks, drill holders and adaptors, arbors, oil and suds pumps, machine vices, lathe chucks, magnetic chucks and equipment, hacksaw blades, broaches, limit switches.





B.S.A high speed tapping attachments. A quick easy pre-setting ensures correct tap-driving pressure with reserve elasticity to relieve the tap of extreme stresses should it encounter an obstruction, thus preventing tap breakage. Three sizes utilise standard hand taps in the range $\frac{3}{15}$ "BSF to $1\frac{3}{4}$ " W., and two versions for capstan and turret lathes, $\frac{3}{15}$ to 1".



B.S.A. NAMCO dieheads are simple in construction and easy to adjust. Circular chasers ensure extreme accuracy of thread form and long life; they can be reground through 270° of their circumference. The range includes types for stationary or revolving spindles and for Swiss type and turret automatics.







variety and quality

B.S.A. SMALL TOOLS LIMITED BIRMINGHAM 11. ENGLAND

Cables: MADRICUT BIRMINGHAM TELEX 33-451

Sole Agents Gt. Brit.

BURTON GRIFFITHS & CO. LTD.

Montgomery Street. Sparkbrook, Birmingham 11

Tel: VICTORIA 2351

